ESTADOS UNIDOS MEXICANOS

DIRECCIÓN GENERAL DE OCEANOGRAFÍA NAVAL

ALMANAQUE NÁUTICO
2001

MÉXICO, D.F.

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Nombre	No.	Mag.	A.H.S.	Dec.
			°	°
Acamar	7	3·1	315	S 40
Achernar	5	0·6	336	S 57
Acrux	30	1·1	173	S 63
Adhara	19	1·6	255	S 29
Aldebaran	10	1·1	291	N 17
Alioth	32	1·7	166	N 56
Alkaid	34	1·9	153	N 49
Al Na'ir	55	2·2	28	S 47
Alnilam	15	1·8	276	S 1
Alphard	25	2·2	218	S 9
Alphecca	41	2·3	126	N 27
Alpheratz	1	2·2	358	N 29
Altair	51	0·9	62	N 9
Ankaa	2	2·4	353	S 42
Antares	42	1·2	113	S 26
Arcturus	37	0·2	146	N 19
Atria	43	1·9	108	S 69
Avior	22	1·7	234	S 60
Bellatrix	13	1·7	279	N 6
Betelgeuse	16	Var.*	271	N 7
Canopus	17	−0·9	264	S 53
Capella	12	0·2	281	N 46
Deneb	53	1·3	50	N 45
Denebola	28	2·2	183	N 15
Diphda	4	2·2	349	S 18
Dubhe	27	2·0	194	N 62
Elnath	14	1·8	278	N 29
Eltanin	47	2·4	91	N 51
Enif	54	2·5	34	N 10
Fomalhaut	56	1·3	16	S 30
Gacrux	31	1·6	172	S 57
Gienah	29	2·8	176	S 18
Hadar	35	0·9	149	S 60
Hamal	6	2·2	328	N 23
Kaus Australis	48	2·0	84	S 34
Kochab	40	2·2	137	N 74
Markab	57	2·6	14	N 15
Menkar	8	2·8	314	N 4
Menkent	36	2·3	148	S 36
Miaplacidus	24	1·8	222	S 70
Mirfak	9	1·9	309	N 50
Nunki	50	2·1	76	S 26
Peacock	52	2·1	54	S 57
Pollux	21	1·2	244	N 28
Procyon	20	0·5	245	N 5
Rasalhague	46	2·1	96	N 13
Regulus	26	1·3	208	N 12
Rigel	11	0·3	281	S 8
Rigil Kentaurus	38	0·1	140	S 61
Sabik	44	2·6	102	S 16
Schedar	3	2·5	350	N 57
Shaula	45	1·7	97	S 37
Sirius	18	−1·6	259	S 17
Spica	33	1·2	159	S 11
Suhail	23	2·2	223	S 43
Vega	49	0·1	81	N 39
Zubenelgenubi	39	2·9	137	S 16

No.	Nombre	Mag.	A.H.S.	Dec.
			°	°
1	*Alpheratz*	2·2	358	N 29
2	*Ankaa*	2·4	353	S 42
3	*Schedar*	2·5	350	N 57
4	*Diphda*	2·2	349	S 18
5	*Achernar*	0·6	336	S 57
6	*Hamal*	2·2	328	N 23
7	*Acamar*	3·1	315	S 40
8	*Menkar*	2·8	314	N 4
9	*Mirfak*	1·9	309	N 50
10	*Aldebaran*	1·1	291	N 17
11	*Rigel*	0·3	281	S 8
12	*Capella*	0·2	281	N 46
13	*Bellatrix*	1·7	279	N 6
14	*Elnath*	1·8	278	N 29
15	*Alnilam*	1·8	276	S 1
16	*Betelgeuse*	Var.*	271	N 7
17	*Canopus*	−0·9	264	S 53
18	*Sirius*	−1·6	259	S 17
19	*Adhara*	1·6	255	S 29
20	*Procyon*	0·5	245	N 5
21	*Pollux*	1·2	244	N 28
22	*Avior*	1·7	234	S 60
23	*Suhail*	2·2	223	S 43
24	*Miaplacidus*	1·8	222	S 70
25	*Alphard*	2·2	218	S 9
26	*Regulus*	1·3	208	N 12
27	*Dubhe*	2·0	194	N 62
28	*Denebola*	2·2	183	N 15
29	*Gienah*	2·8	176	S 18
30	*Acrux*	1·1	173	S 63
31	*Gacrux*	1·6	172	S 57
32	*Alioth*	1·7	166	N 56
33	*Spica*	1·2	159	S 11
34	*Alkaid*	1·9	153	N 49
35	*Hadar*	0·9	149	S 60
36	*Menkent*	2·3	148	S 36
37	*Arcturus*	0·2	146	N 19
38	*Rigil Kentaurus*	0·1	140	S 61
39	*Zubenelgenubi*	2·9	137	S 16
40	*Kochab*	2·2	137	N 74
41	*Alphecca*	2·3	126	N 27
42	*Antares*	1·2	113	S 26
43	*Atria*	1·9	108	S 69
44	*Sabik*	2·6	102	S 16
45	*Shaula*	1·7	97	S 37
46	*Rasalhague*	2·1	96	N 13
47	*Eltanin*	2·4	91	N 51
48	*Kaus Australis*	2·0	84	S 34
49	*Vega*	0·1	81	N 39
50	*Nunki*	2·1	76	S 26
51	*Altair*	0·9	62	N 9
52	*Peacock*	2·1	54	S 57
53	*Deneb*	1·3	50	N 45
54	*Enif*	2·5	34	N 10
55	*Al Na'ir*	2·2	28	S 47
56	*Fomalhaut*	1·3	16	S 30
57	*Markab*	2·6	14	N 15

*0·1 — 1·2

LISTA DE CONTENIDOS

Páginas	
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$A_2 - A_3$	Tablas de corrección de altura para el Sol, estrellas y planetas.
A_4	Correcciones adicionales por refracción para condiciones no estándar.
Hojas sueltas	Lo mismo de la contraportada anterior A_2, la página xxxiii y la lista de contenido.

A_2 TABLAS DE CORRECCIONES DE ALTURA DE 10°-90° —DEL SOL, ESTRELLAS Y PLANETAS

SOL

OCT.—MAR. Alt. Ap.	Limbo Inf.	Limbo Sup.	ABR.—SEP. Alt. Ap.	Limbo Inf.	Limbo Sup.
° ′	′	′	° ′	′	′
9 34	+10·8	−21·5	9 39	+10·6	−21·2
9 45	+10·9	−21·4	9 51	+10·7	−21·1
9 56	+11·0	−21·3	10 03	+10·8	−21·0
10 08	+11·1	−21·2	10 15	+10·9	−20·9
10 21	+11·2	−21·1	10 27	+11·0	−20·8
10 34	+11·3	−21·0	10 40	+11·1	−20·7
10 47	+11·4	−20·9	10 54	+11·2	−20·6
11 01	+11·5	−20·8	11 08	+11·3	−20·5
11 15	+11·6	−20·7	11 23	+11·4	−20·4
11 30	+11·7	−20·6	11 38	+11·5	−20·3
11 46	+11·8	−20·5	11 54	+11·6	−20·2
12 02	+11·9	−20·4	12 10	+11·7	−20·1
12 19	+12·0	−20·3	12 28	+11·8	−20·0
12 37	+12·1	−20·2	12 46	+11·9	−19·9
12 55	+12·2	−20·1	13 05	+12·0	−19·8
13 14	+12·3	−20·0	13 24	+12·1	−19·7
13 35	+12·4	−19·9	13 45	+12·2	−19·6
13 56	+12·5	−19·8	14 07	+12·3	−19·5
14 18	+12·6	−19·7	14 30	+12·4	−19·4
14 42	+12·7	−19·6	14 54	+12·5	−19·3
15 06	+12·8	−19·5	15 19	+12·6	−19·2
15 32	+12·9	−19·4	15 46	+12·7	−19·1
15 59	+13·0	−19·3	16 14	+12·8	−19·0
16 28	+13·1	−19·2	16 44	+12·9	−18·9
16 59	+13·2	−19·1	17 15	+13·0	−18·8
17 32	+13·3	−19·0	17 48	+13·1	−18·7
18 06	+13·4	−18·9	18 24	+13·2	−18·6
18 42	+13·5	−18·8	19 01	+13·3	−18·5
19 21	+13·6	−18·7	19 42	+13·4	−18·4
20 03	+13·7	−18·6	20 25	+13·5	−18·3
20 48	+13·8	−18·5	21 11	+13·6	−18·2
21 35	+13·9	−18·4	22 00	+13·7	−18·1
22 26	+14·0	−18·3	22 54	+13·8	−18·0
23 22	+14·1	−18·2	23 51	+13·9	−17·9
24 21	+14·2	−18·1	24 53	+14·0	−17·8
25 26	+14·3	−18·0	26 00	+14·1	−17·7
26 36	+14·4	−17·9	27 13	+14·2	−17·6
27 52	+14·5	−17·8	28 33	+14·3	−17·5
29 15	+14·6	−17·7	30 00	+14·4	−17·4
30 46	+14·7	−17·6	31 35	+14·5	−17·3
32 26	+14·8	−17·5	33 20	+14·6	−17·2
34 17	+14·9	−17·4	35 17	+14·7	−17·1
36 20	+15·0	−17·3	37 26	+14·8	−17·0
38 36	+15·1	−17·2	39 50	+14·9	−16·9
41 08	+15·2	−17·1	42 31	+15·0	−16·8
43 59	+15·3	−17·0	45 31	+15·1	−16·7
47 10	+15·4	−16·9	48 55	+15·2	−16·6
50 46	+15·5	−16·8	52 44	+15·3	−16·5
54 49	+15·6	−16·7	57 02	+15·4	−16·4
59 23	+15·7	−16·6	61 51	+15·5	−16·3
64 30	+15·8	−16·5	67 17	+15·6	−16·2
70 12	+15·9	−16·4	73 16	+15·7	−16·1
76 26	+16·0	−16·3	79 43	+15·8	−16·0
83 05	+16·1	−16·2	86 32	+15·9	−15·9
90 00			90 00		

ESTRELLAS Y PLANETAS

Alt. Ap.	Corr.
° ′	′
9 56	−5·3
10 08	−5·2
10 20	−5·1
10 33	−5·0
10 46	−4·9
11 00	−4·8
11 14	−4·7
11 29	−4·6
11 45	−4·5
12 01	−4·4
12 18	−4·3
12 35	−4·2
12 54	−4·1
13 13	−4·0
13 33	−3·9
13 54	−3·8
14 16	−3·7
14 40	−3·6
15 04	−3·5
15 30	−3·4
15 57	−3·3
16 26	−3·2
16 56	−3·1
17 28	−3·0
18 02	−2·9
18 38	−2·8
19 17	−2·7
19 58	−2·6
20 42	−2·5
21 28	−2·4
22 19	−2·3
23 13	−2·2
24 11	−2·1
25 14	−2·0
26 22	−1·9
27 36	−1·8
28 56	−1·7
30 24	−1·6
32 00	−1·5
33 45	−1·4
35 40	−1·3
37 48	−1·2
40 08	−1·1
42 44	−1·0
45 36	−0·9
48 47	−0·8
52 18	−0·7
56 11	−0·6
60 28	−0·5
65 08	−0·4
70 11	−0·3
75 34	−0·2
81 13	−0·1
87 03	0·0
90 00	

Alt. Ap.	Corrección Adicional
2001	
VENUS	
Ene. 1–Ene. 30	
Mayo 25–Jul. 13	
°	′
0	+0·2
41	+0·1
76	
Ene. 31–Feb. 23	
Mayo 3–Mayo 24	
°	′
0	+0·3
34	+0·2
60	+0·1
80	
Feb. 24–Mar. 11	
Abr. 17–Mayo 2	
°	′
0	+0·4
29	+0·3
51	+0·2
68	+0·1
83	
Mar. 12–Abr. 16	
°	′
0	+0·5
26	+0·4
46	+0·3
60	+0·2
73	+0·1
84	
Jul. 14–Dic. 31	
°	′
0	+0·1
60	
MARTE	
Ene. 1–Marzo 23	
Oct. 18–Dic. 31	
°	′
0	+0·1
60	
Marzo 24–Mayo 11	
Ago. 9–Oct. 17	
°	′
0	+0·2
41	+0·1
76	
Mayo 12–Ago. 8	
°	′
0	+0·3
34	+0·2
60	+0·1
80	

DEPRESION

Alt. del Ojo	Corr.	Alt. del Ojo	Alt. del Ojo	Corr.
m	′	pies	m	′
2·4	−2·8	8·0	1·0	−1·8
2·6	−2·9	8·6	1·5	−2·2
2·8	−3·0	9·2	2·0	−2·5
3·0	−3·1	9·8	2·5	−2·8
3·2	−3·2	10·5	3·0	−3·0
3·4	−3·3	11·2	Ver tabla ←	
3·6	−3·4	11·9		
3·8	−3·5	12·6		
4·0	−3·6	13·3	m	′
4·3	−3·7	14·1	20	−7·9
4·5	−3·8	14·9	22	−8·3
4·7	−3·9	15·7	24	−8·6
5·0	−4·0	16·5	26	−9·0
5·2	−4·1	17·4	28	−9·3
5·5	−4·2	18·3	30	−9·6
5·8	−4·3	19·1	32	−10·0
6·1	−4·4	20·1	34	−10·3
6·3	−4·5	21·0	36	−10·6
6·6	−4·6	22·0	38	−10·8
6·9	−4·7	22·9	40	−11·1
7·2	−4·8	23·9	42	−11·4
7·5	−4·9	24·9	44	−11·7
7·9	−5·0	26·0	46	−11·9
8·2	−5·1	27·1	48	−12·2
8·5	−5·2	28·1	pies	′
8·8	−5·3	29·2	2	−1·4
9·2	−5·4	30·4	4	−1·9
9·5	−5·5	31·5	6	−2·4
9·9	−5·6	32·7	8	−2·7
10·3	−5·7	33·9	10	−3·1
10·6	−5·8	35·1	Ver tabla ←	
11·0	−5·9	36·3		
11·4	−6·0	37·6		
11·8	−6·1	38·9		
12·2	−6·2	40·1	pies	′
12·6	−6·3	41·5	70	−8·1
13·0	−6·4	42·8	75	−8·4
13·4	−6·5	44·2	80	−8·7
13·8	−6·6	45·5	85	−8·9
14·2	−6·7	46·9	90	−9·2
14·7	−6·8	48·4	95	−9·5
15·1	−6·9	49·8	100	−9·7
15·5	−7·0	51·3	105	−9·9
16·0	−7·1	52·8	110	−10·2
16·5	−7·2	54·3	115	−10·4
16·9	−7·3	55·8	120	−10·6
17·4	−7·4	57·4	125	−10·8
17·9	−7·5	58·9	130	−11·1
18·4	−7·6	60·5	135	−11·3
18·8	−7·7	62·1	140	−11·5
19·3	−7·8	63·8	145	−11·7
19·8	−7·9	65·4	150	−11·9
20·4	−8·0	67·1	155	−12·1
20·9	−8·1	68·8		
21·4		70·5		

Alt. Ap. = Altura aparente = Altura del sextante corregida por error de índice y depresión.

A_2 TABLAS DE CORRECCIONES DE ALTURA DE 10°-90° —DEL SOL, ESTRELLAS Y PLANETAS

SOL

OCT.—MAR. Alt. Ap.	Limbo Inf.	Limbo Sup.	ABR.—SEP. Alt. Ap.	Limbo Inf.	Limbo Sup.
° ′	′	′	° ′	′	′
9 34	+10·8	−21·5	9 39	+10·6	−21·2
9 45	+10·9	−21·4	9 51	+10·7	−21·1
9 56	+11·0	−21·3	10 03	+10·8	−21·0
10 08	+11·1	−21·2	10 15	+10·9	−20·9
10 21	+11·2	−21·1	10 27	+11·0	−20·8
10 34	+11·3	−21·0	10 40	+11·1	−20·7
10 47	+11·4	−20·9	10 54	+11·2	−20·6
11 01	+11·5	−20·8	11 08	+11·3	−20·5
11 15	+11·6	−20·7	11 23	+11·4	−20·4
11 30	+11·7	−20·6	11 38	+11·5	−20·3
11 46	+11·8	−20·5	11 54	+11·6	−20·2
12 02	+11·9	−20·4	12 10	+11·7	−20·1
12 19	+12·0	−20·3	12 28	+11·8	−20·0
12 37	+12·1	−20·2	12 46	+11·9	−19·9
12 55	+12·2	−20·1	13 05	+12·0	−19·8
13 14	+12·3	−20·0	13 24	+12·1	−19·7
13 35	+12·4	−19·9	13 45	+12·2	−19·6
13 56	+12·5	−19·8	14 07	+12·3	−19·5
14 18	+12·6	−19·7	14 30	+12·4	−19·4
14 42	+12·7	−19·6	14 54	+12·5	−19·3
15 06	+12·8	−19·5	15 19	+12·6	−19·2
15 32	+12·9	−19·4	15 46	+12·7	−19·1
15 59	+13·0	−19·3	16 14	+12·8	−19·0
16 28	+13·1	−19·2	16 44	+12·9	−18·9
16 59	+13·2	−19·1	17 15	+13·0	−18·8
17 32	+13·3	−19·0	17 48	+13·1	−18·7
18 06	+13·4	−18·9	18 24	+13·2	−18·6
18 42	+13·5	−18·8	19 01	+13·3	−18·5
19 21	+13·6	−18·7	19 42	+13·4	−18·4
20 03	+13·7	−18·6	20 25	+13·5	−18·3
20 48	+13·8	−18·5	21 11	+13·6	−18·2
21 35	+13·9	−18·4	22 00	+13·7	−18·1
22 26	+14·0	−18·3	22 54	+13·8	−18·0
23 22	+14·1	−18·2	23 51	+13·9	−17·9
24 21	+14·2	−18·1	24 53	+14·0	−17·8
25 26	+14·3	−18·0	26 00	+14·1	−17·7
26 36	+14·4	−17·9	27 13	+14·2	−17·6
27 52	+14·5	−17·8	28 33	+14·3	−17·5
29 15	+14·6	−17·7	30 00	+14·4	−17·4
30 46	+14·7	−17·6	31 35	+14·5	−17·3
32 26	+14·8	−17·5	33 20	+14·6	−17·2
34 17	+14·9	−17·4	35 17	+14·7	−17·1
36 20	+15·0	−17·3	37 26	+14·8	−17·0
38 36	+15·1	−17·2	39 50	+14·9	−16·9
41 08	+15·2	−17·1	42 31	+15·0	−16·8
43 59	+15·3	−17·0	45 31	+15·1	−16·7
47 10	+15·4	−16·9	48 55	+15·2	−16·6
50 46	+15·5	−16·8	52 44	+15·3	−16·5
54 49	+15·6	−16·7	57 02	+15·4	−16·4
59 23	+15·7	−16·6	61 51	+15·5	−16·3
64 30	+15·8	−16·5	67 17	+15·6	−16·2
70 12	+15·9	−16·4	73 16	+15·7	−16·1
76 26	+16·0	−16·3	79 43	+15·8	−16·0
83 05	+16·1	−16·2	86 32	+15·9	−15·9
90 00			90 00		

ESTRELLAS Y PLANETAS

Alt. Ap.	Corr.
° ′	′
9 56	−5·3
10 08	−5·2
10 20	−5·1
10 33	−5·0
10 46	−4·9
11 00	−4·8
11 14	−4·7
11 29	−4·6
11 45	−4·5
12 01	−4·4
12 18	−4·3
12 35	−4·2
12 54	−4·1
13 13	−4·0
13 33	−3·9
13 54	−3·8
14 16	−3·7
14 40	−3·6
15 04	−3·5
15 30	−3·4
15 57	−3·3
16 26	−3·2
16 56	−3·1
17 28	−3·0
18 02	−2·9
18 38	−2·8
19 17	−2·7
19 58	−2·6
20 42	−2·5
21 28	−2·4
22 19	−2·3
23 13	−2·2
24 11	−2·1
25 14	−2·0
26 22	−1·9
27 36	−1·8
28 56	−1·7
30 24	−1·6
32 00	−1·5
33 45	−1·4
35 40	−1·3
37 48	−1·2
40 08	−1·1
42 44	−1·0
45 36	−0·9
48 47	−0·8
52 18	−0·7
56 11	−0·6
60 28	−0·5
65 08	−0·4
70 11	−0·3
75 34	−0·2
81 13	−0·1
87 03	0·0
90 00	

Alt. Ap.	Corrección Adicional
2001	
VENUS	
Ene. 1–Ene. 30	
Mayo 25–Jul. 13	
°	′
0	+0·2
41	+0·1
76	
Ene. 31–Feb. 23	
Mayo 3–Mayo 24	
°	′
0	+0·3
34	+0·2
60	+0·1
80	
Feb. 24–Mar. 11	
Abr. 17–Mayo 2	
°	′
0	+0·4
29	+0·3
51	+0·2
68	+0·1
83	
Mar. 12–Abr. 16	
°	′
0	+0·5
26	+0·4
46	+0·3
60	+0·2
73	+0·1
84	
Jul. 14–Dic. 31	
°	′
0	+0·1
60	
MARTE	
Ene. 1–Marzo 23	
Oct. 18–Dic. 31	
°	′
0	+0·1
60	
Marzo 24–Mayo 11	
Ago. 9–Oct. 17	
°	′
0	+0·2
41	+0·1
76	
Mayo 12–Ago. 8	
°	′
0	+0·3
34	+0·2
60	+0·1
80	

DEPRESION

Alt. del Ojo	Corr.	Alt. del Ojo
m	′	pies
2·4	−2·8	8·0
2·6	−2·9	8·6
2·8	−3·0	9·2
3·0	−3·1	9·8
3·2	−3·2	10·5
3·4	−3·3	11·2
3·6	−3·4	11·9
3·8	−3·5	12·6
4·0	−3·6	13·3
4·3	−3·7	14·1
4·5	−3·8	14·9
4·7	−3·9	15·7
5·0	−4·0	16·5
5·2	−4·1	17·4
5·5	−4·2	18·3
5·8	−4·3	19·1
6·1	−4·4	20·1
6·3	−4·5	21·0
6·6	−4·6	22·0
6·9	−4·7	22·9
7·2	−4·8	23·9
7·5	−4·9	24·9
7·9	−5·0	26·0
8·2	−5·1	27·1
8·5	−5·2	28·1
8·8	−5·3	29·2
9·2	−5·4	30·4
9·5	−5·5	31·5
9·9	−5·6	32·7
10·3	−5·7	33·9
10·6	−5·8	35·1
11·0	−5·9	36·3
11·4	−6·0	37·6
11·8	−6·1	38·9
12·2	−6·2	40·1
12·6	−6·3	41·5
13·0	−6·4	42·8
13·4	−6·5	44·2
13·8	−6·6	45·5
14·2	−6·7	46·9
14·7	−6·8	48·4
15·1	−6·9	49·8
15·5	−7·0	51·3
16·0	−7·1	52·8
16·5	−7·2	54·3
16·9	−7·3	55·8
17·4	−7·4	57·4
17·9	−7·5	58·9
18·4	−7·6	60·5
18·8	−7·7	62·1
19·3	−7·8	63·8
19·8	−7·9	65·4
20·4	−8·0	67·1
20·9	−8·1	68·8
21·4		70·5

Alt. del Ojo	Corr.
m	′
1·0	−1·8
1·5	−2·2
2·0	−2·5
2·5	−2·8
3·0	−3·0
Ver tabla ←	
m	′
20	−7·9
22	−8·3
24	−8·6
26	−9·0
28	−9·3
30	−9·6
32	−10·0
34	−10·3
36	−10·6
38	−10·8
40	−11·1
42	−11·4
44	−11·7
46	−11·9
48	−12·2
pies	′
2	−1·4
4	−1·9
6	−2·4
8	−2·7
10	−3·1
Ver tabla ←	
pies	′
70	−8·1
75	−8·4
80	−8·7
85	−8·9
90	−9·2
95	−9·5
100	−9·7
105	−9·9
110	−10·2
115	−10·4
120	−10·6
125	−10·8
130	−11·1
135	−11·3
140	−11·5
145	−11·7
150	−11·9
155	−12·1

Alt. Ap. = Altura aparente = Altura del sextante corregida por error de índice y depresión.

TABLAS DE CORRECCIONES DE ALTURA DE 0°-10° — DEL SOL, ESTRELLAS Y PLANETAS A_3

Alt. Ap.	OCT.—MAR. SOL ABR.—SEP. Limbo Inf.	Limbo Sup.	Limbo Inf.	Limbo Sup.	ESTRELLAS PLANETAS
° ′	′	′	′	′	′
0 00	−18·2	−50·5	−18·4	−50·2	−34·5
03	17·5	49·8	17·8	49·6	33·8
06	16·9	49·2	17·1	48·9	33·2
09	16·3	48·6	16·5	48·3	32·6
12	15·7	48·0	15·9	47·7	32·0
15	15·1	47·4	15·3	47·1	31·4
0 18	−14·5	−46·8	−14·8	−46·6	−30·8
21	14·0	46·3	14·2	46·0	30·3
24	13·5	45·8	13·7	45·5	29·8
27	12·9	45·2	13·2	45·0	29·2
30	12·4	44·7	12·7	44·5	28·7
33	11·9	44·2	12·2	44·0	28·2
0 36	−11·5	−43·8	−11·7	−43·5	−27·8
39	11·0	43·3	11·2	43·0	27·3
42	10·5	42·8	10·8	42·6	26·8
45	10·1	42·4	10·3	42·1	26·4
48	9·6	41·9	9·9	41·7	25·9
51	9·2	41·5	9·5	41·3	25·5
0 54	−8·8	−41·1	−9·1	−40·9	−25·1
0 57	8·4	40·7	8·7	40·5	24·7
1 00	8·0	40·3	8·3	40·1	24·3
03	7·7	40·0	7·9	39·7	24·0
06	7·3	39·6	7·5	39·3	23·6
09	6·9	39·2	7·2	39·0	23·2
1 12	−6·6	−38·9	−6·8	−38·6	−22·9
15	6·2	38·5	6·5	38·3	22·5
18	5·9	38·2	6·2	38·0	22·2
21	5·6	37·9	5·8	37·6	21·9
24	5·3	37·6	5·5	37·3	21·6
27	4·9	37·2	5·2	37·0	21·2
1 30	−4·6	−36·9	−4·9	−36·7	−20·9
35	4·2	36·5	4·4	36·2	20·5
40	3·7	36·0	4·0	35·8	20·0
45	3·2	35·5	3·5	35 3	19·5
50	2·8	35·1	3·1	34·9	19·1
1 55	2·4	34·7	2·6	34·4	18·7
2 00	−2·0	−34·3	−2·2	−34·0	−18·3
05	1·6	33·9	1·8	33·6	17·9
10	1·2	33·5	1·5	33·3	17·5
15	0·9	33·2	1·1	32·9	17·2
20	0·5	32·8	0·8	32·6	16·8
25	−0·2	32·5	0·4	32·2	16·5
2 30	+0·2	−32·1	−0·1	−31·9	−16·1
35	0·5	31·8	+0·2	31·6	15·8
40	0·8	31·5	0·5	31·3	15·5
45	1·1	31·2	0·8	31·0	15·2
50	1·4	30·9	1·1	30·7	14·9
2 55	1·6	30·7	1·4	30·4	14·7
3 00	+1·9	−30·4	+1·7	−30·1	−14·4
05	2·2	30·1	1·9	29·9	14·1
10	2·4	29·9	2·1	29·7	13·9
15	2·6	29·7	2·4	29·4	13·7
20	2·9	29·4	2·6	29·2	13·4
25	3·1	29·2	2·9	28·9	13·2
3 30	+3·3	−29·0	+3·1	−28·7	−13·0

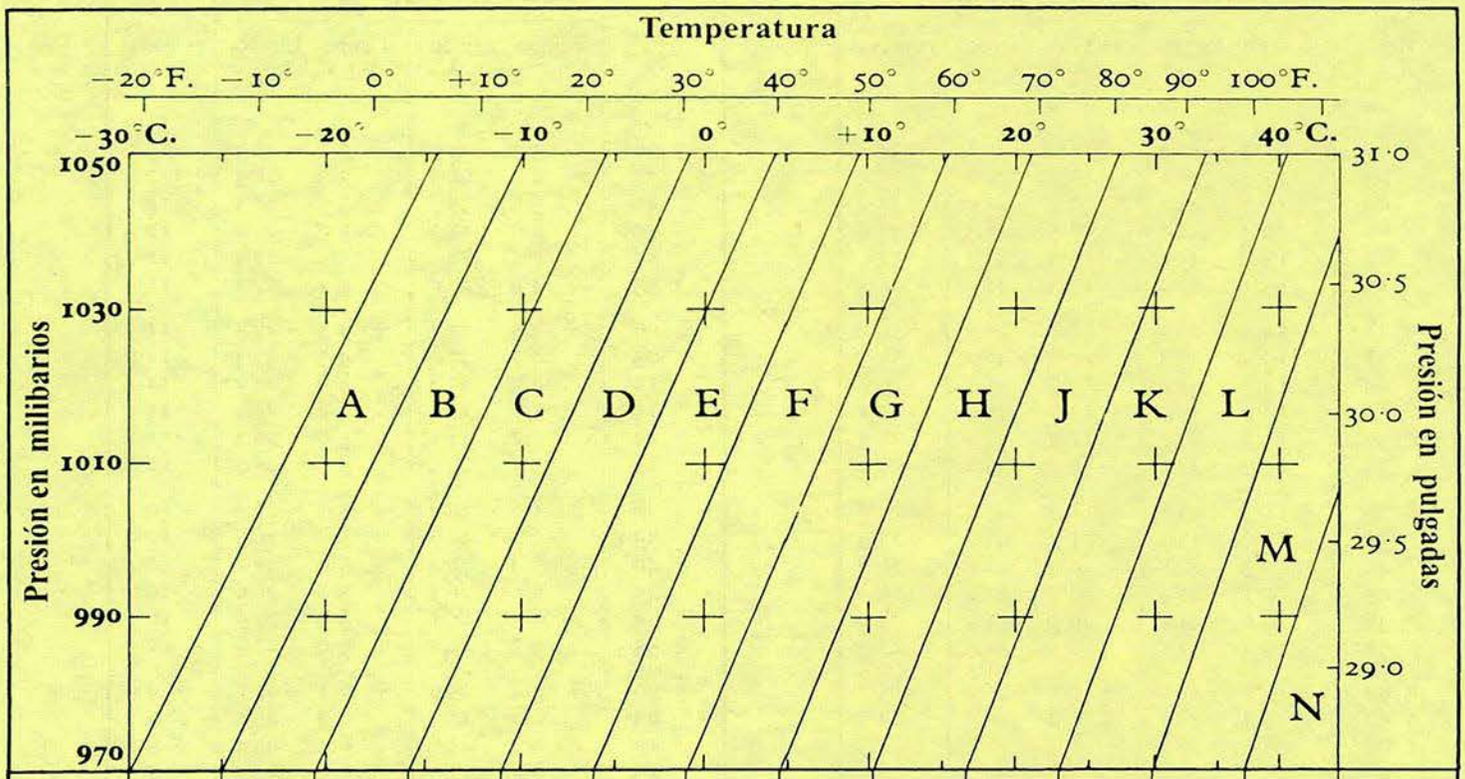
Alt. Ap.	OCT.—MAR. SOL ABR.—SEP. Limbo Inf.	Limbo Sup.	Limbo Inf.	Limbo Sup.	ESTRELLAS PLANETAS
° ′	′	′	′	′	′
3 30	+3·3	−29·0	+3·1	−28·7	−13·0
35	3·6	28·7	3·3	28·5	12·7
40	3·8	28·5	3·5	28·3	12·5
45	4·0	28·3	3·7	28·1	12·3
50	4·2	28·1	3·9	27·9	12·1
3 55	4·4	27·9	4·1	27·7	11·9
4 00	+4·5	−27·8	+4·3	−27·5	−11·8
05	4·7	27·6	4·5	27·3	11·6
10	4·9	27·4	4·6	27·2	11·4
15	5·1	27·2	4·8	27·0	11·2
20	5·2	27·1	5·0	26·8	11·1
25	5·4	26·9	5·1	26·7	10·9
4 30	+5·6	−26·7	+5·3	−26·5	−10·7
35	5·7	26·6	5·5	26·3	10·6
40	5·9	26·4	5·6	26·2	10·4
45	6·0	26·3	5·8	26·0	10·3
50	6·2	26·1	5·9	25·9	10·1
4 55	6·3	26·0	6·0	25·8	10·0
5 00	+6·4	−25·9	+6·2	−25·6	−9·9
05	6·6	25·7	6·3	25·5	9·7
10	6·7	25·6	6·4	25·4	9·6
15	6·8	25·5	6·6	25·2	9·5
20	6·9	25·4	6·7	25·1	9·4
25	7·1	25·2	6·8	25·0	9·2
5 30	+7·2	−25·1	+6·9	−24·9	−9·1
35	7·3	25·0	7·0	24·8	9·0
40	7·4	24·9	7·2	24·6	8·9
45	7·5	24·8	7·3	24·5	8·8
50	7·6	24·7	7·4	24·4	8·7
5 55	7·7	24·6	7·5	24·3	8·6
6 00	+7·8	−24·5	+7·6	−24·2	−8·5
10	8·0	24·3	7·8	24·0	8·3
20	8·2	24·1	8·0	23·8	8·1
30	8·4	23·9	8·1	23·7	7·9
40	8·6	23·7	8·3	23·5	7·7
50	8·7	23·6	8·5	23·3	7·6
7 00	+8·9	−23·4	+8·6	−23·2	−7·4
10	9·1	23·2	8·8	23·0	7·2
20	9·2	23·1	9·0	22·8	7·1
30	9·3	23·0	9·1	22·7	7·0
40	9·5	22·8	9·2	22·6	6·8
7 50	9·6	22·7	9·4	22·4	6·7
8 00	+9·7	−22·6	+9·5	−22·3	−6·6
10	9·9	22·4	9·6	22·2	6·4
20	10·0	22·3	9·7	22·1	6·3
30	10·1	22·2	9·8	22·0	6·2
40	10·2	22·1	10·0	21·8	6·1
8 50	10·3	22·0	10·1	21·7	6·0
9 00	+10·4	−21·9	+10·2	−21·6	−5·9
10	10·5	21·8	10·3	21·5	5·8
20	10·6	21·7	10·4	21·4	5·7
30	10·7	21·6	10·5	21·3	5·6
40	10·8	21·5	10·6	21·2	5·5
9 50	10·9	21·4	10·6	21·2	5·4
10 00	+11·0	−21·3	+10·7	−21·1	−5·3

En la página siguiente se dan correcciones adicionales por temperatura y presión.

Para observaciones con sextante de burbuja, ignorar la depresión y usar las correcciones de estrellas para el Sol, planetas y estrellas.

A4 TABLAS DE CORRECCION DE ALTURAS — CORRECCIONES ADICIONALES

CORRECCIONES ADICIONALES A LA REFRACCION PARA CONDICIONES ANORMALES



Alt.° Ap.	A	B	C	D	E	F	G	H	J	K	L	M	N	Alt. Ap.
0 00	−6·9	−5·7	−4·6	−3·4	−2·3	−1·1	0·0	+1·1	+2·3	+3·4	+4·6	+5·7	+6·9	0 00
0 30	5·2	4·4	3·5	2·6	1·7	0·9	0·0	0·9	1·7	2·6	3·5	4·4	5·2	0 30
1 00	4·3	3·5	2·8	2·1	1·4	0·7	0·0	0·7	1·4	2·1	2·8	3·5	4·3	1 00
1 30	3·5	2·9	2·4	1·8	1·2	0·6	0·0	0·6	1·2	1·8	2·4	2·9	3·5	1 30
2 00	3·0	2·5	2·0	1·5	1·0	0·5	0·0	0·5	1·0	1·5	2·0	2·5	3·0	2 00
2 30	−2·5	−2·1	−1·6	−1·2	−0·8	−0·4	0·0	+0·4	+0·8	+1·2	+1·6	+2·1	+2·5	2 30
3 00	2·2	1·8	1·5	1·1	0·7	0·4	0·0	0·4	0·7	1·1	1·5	1·8	2·2	3 00
3 30	2·0	1·6	1·3	1·0	0·7	0·3	0·0	0·3	0·7	1·0	1·3	1·6	2·0	3 30
4 00	1·8	1·5	1·2	0·9	0·6	0·3	0·0	0·3	0·6	0·9	1·2	1·5	1·8	4 00
4 30	1·6	1·4	1·1	0·8	0·5	0·3	0·0	0·3	0·5	0·8	1·1	1·4	1·6	4 30
5 00	−1·5	−1·3	−1·0	−0·8	−0·5	−0·2	0·0	+0·2	+0·5	+0·8	+1·0	+1·3	+1·5	5 00
6	1·3	1·1	0·9	0·6	0·4	0·2	0·0	0·2	0·4	0·6	0·9	1·1	1·3	6
7	1·1	0·9	0·7	0·6	0·4	0·2	0·0	0·2	0·4	0·6	0·7	0·9	1·1	7
8	1·0	0·8	0·7	0·5	0·3	0·2	0·0	0·2	0·3	0·5	0·7	0·8	1·0	8
9	0·9	0·7	0·6	0·4	0·3	0·1	0·0	0·1	0·3	0·4	0·6	0·7	0·9	9
10 00	−0·8	−0·7	−0·5	−0·4	−0·3	−0·1	0·0	+0·1	+0·3	+0·4	+0·5	+0·7	+0·8	10 00
12	0·7	0·6	0·5	0·3	0·2	0·1	0·0	0·1	0·2	0·3	0·5	0·6	0·7	12
14	0·6	0·5	0·4	0·3	0·2	0·1	0·0	0·1	0·2	0·3	0·4	0·5	0·6	14
16	0·5	0·4	0·3	0·3	0·2	0·1	0·0	0·1	0·2	0·3	0·3	0·4	0·5	16
18	0·4	0·4	0·3	0·2	0·2	0·1	0·0	0·1	0·2	0·2	0·3	0·4	0·4	18
20 00	−0·4	−0·3	−0·3	−0·2	−0·1	−0·1	0·0	+0·1	+0·1	+0·2	+0·3	+0·3	+0·4	20 00
25	0·3	0·3	0·2	0·2	0·1	−0·1	0·0	+0·1	0·1	0·2	0·2	0·3	0·3	25
30	0·3	0·2	0·2	0·1	0·1	0·0	0·0	0·0	0·1	0·1	0·2	0·2	0·3	30
35	0·2	0·2	0·1	0·1	0·1	0·0	0·0	0·0	0·1	0·1	0·1	0·2	0·2	35
40	0·2	0·1	0·1	0·1	−0·1	0·0	0·0	0·0	+0·1	0·1	0·1	0·1	0·2	40
50 00	−0·1	−0·1	−0·1	−0·1	0·0	0·0	0·0	0·0	0·0	+0·1	+0·1	+0·1	+0·1	50 00

Se entra en la gráfica con los argumentos temperatura y presión para encontrar la letra correspondiente a la zona; usando como argumento esta letra de zona y altura aparente (altura del sextante corregida por depresión), se toma la corrección de la tabla. Esta corrección se aplica a la lectura del sextante en adición a las correcciones para condiciones normales (para el Sol, estrellas y planetas de la página A2 y de la luna de las páginas xxxiv y xxxv).

PREFACIO

La presente publicación constituye la versión mexicana de "The Nautical Almanac'' británico y americano que se produce respectivamente por el Observatorio de Greenwich en la Gran Bretaña y por el Observatorio Naval de los Estados Unidos de América. Es idéntica en su contenido.

ANIVERSARIOS 2001

Año Nuevo	Lunes	1	de	Enero
Constitución Política de los Estados Unidos Mexicanos	Lunes	5	de	Febrero
Día de la Bandera Nacional	Sábado	24	de	Febrero
Natalicio del Lic. Don Benito Juárez García	Miércoles	21	de	Marzo
Defensa del Puerto de Veracruz	Sábado	21	de	Abril
Día del Trabajo	Martes	1	de	Mayo
Batalla de Puebla	Sábado	5	de	Mayo
Día de la Marina Nacional	Viernes	1	de	Junio
Muerte del Lic. Don Benito Juárez García	Miércoles	18	de	Julio
Muerte de Don Miguel Hidalgo y Costilla	Lunes	30	de	Julio
Independencia Nacional	Domingo	16	de	Septiembre
Día de la Raza	Viernes	12	de	Octubre
Revolución Mexicana	Martes	20	de	Noviembre
Día de la Armada de México	Viernes	23	de	Noviembre
Muerte de Don José María Morelos y Pavón	Sábado	22	de	Diciembre
Navidad	Martes	25	de	Diciembre

FASES DE LA LUNA

LUNA NUEVA

	d	h	m
Ene.	24	13	07
Feb.	23	08	21
Mar.	25	01	21
Abr.	23	15	26
May.	23	02	46
Jun.	21	11	58
Jul.	20	19	44
Ago.	19	02	55
Sep.	17	10	27
Oct.	16	19	23
Nov.	15	06	40
Dic.	14	20	47

LUNA LLENA

	d	h	m
Ene.	9	20	24
Feb.	8	07	12
Mar.	9	17	23
Abr.	8	03	22
May.	7	13	52
Jun.	6	01	39
Jul.	5	15	04
Ago.	4	05	56
Sep.	2	21	43
Oct.	2	13	49
Nov.	1	05	41
Nov.	30	20	49
Dic.	30	10	40

CUARTO CRECIENTE

	d	h	m
Ene.	2	22	31
Feb.	1	14	02
Mar.	3	02	03
Abr.	1	10	49
Abr.	30	17	08
May.	29	22	09
Jun.	28	03	19
Jul.	27	10	08
Ago.	25	19	55
Sep.	24	09	31
Oct.	24	02	58
Nov.	22	23	21
Dic.	22	20	56

CUARTO MENGUANTE

	d	h	m
Ene.	16	12	35
Feb.	15	03	23
Mar.	16	20	45
Abr.	15	15	31
May.	15	10	11
Jun.	14	03	28
Jul.	13	18	45
Ago.	12	07	53
Sep.	10	18	59
Oct.	10	04	20
Nov.	8	12	21
Dic.	7	19	52

Tiempo del meridiano de Greenwich T.M.G. = (T.U.)

DIAS DE LA SEMANA Y DIAS DEL AÑO

	ENE.	FEB.	MAR.	ABR.	MAY.	JUN.	JUL.	AGO.	SEP.	OCT.	NOV.	DIC.
Día	Sem. Año	Sem. Año	Sem. Año	Sem. Año	Sem. Año	Sem. Año	Sem. Año	Sem. Año	Sem. Año	Sem. Año	Sem. Año	Sem. Año
1	L. 1	J. 32	J. 60	D. 91	M. 121	V. 152	D. 182	Mi. 213	S. 244	L. 274	J. 305	S. 335
2	M. 2	V. 33	V. 61	L. 92	Mi. 122	S. 153	L. 183	J. 214	D. 245	M. 275	V. 306	D. 336
3	Mi. 3	S. 34	S. 62	M. 93	J. 123	D. 154	M. 184	V. 215	L. 246	Mi. 276	S. 307	L. 337
4	J. 4	D. 35	D. 63	Mi. 94	V. 124	L. 155	Mi. 185	S. 216	M. 247	J. 277	D. 308	M. 338
5	V. 5	L. 36	L. 64	J. 95	S. 125	M. 156	J. 186	D. 217	Mi. 248	V. 278	L. 309	Mi. 339
6	S. 6	M. 37	M. 65	V. 96	D. 126	Mi. 157	V. 187	L. 218	J. 249	S. 279	M. 310	J. 340
7	D. 7	Mi. 38	Mi. 66	S. 97	L. 127	J. 158	S. 188	M. 219	V. 250	D. 280	Mi. 311	V. 341
8	L. 8	J. 39	J. 67	D. 98	M. 128	V. 159	D. 189	Mi. 220	S. 251	L. 281	J. 312	S. 342
9	M. 9	V. 40	V. 68	L. 99	Mi. 129	S. 160	L. 190	J. 221	D. 252	M. 282	V. 313	D. 343
10	Mi. 10	S. 41	S. 69	M. 100	J. 130	D. 161	M. 191	V. 222	L. 253	Mi. 283	S. 314	L. 344
11	J. 11	D. 42	D. 70	Mi. 101	V. 131	L. 162	Mi. 192	S. 223	M. 254	J. 284	D. 315	M. 345
12	V. 12	L. 43	L. 71	J. 102	S. 132	M. 163	J. 193	D. 224	Mi. 255	V. 285	L. 316	Mi. 346
13	S. 13	M. 44	M. 72	V. 103	D. 133	Mi. 164	V. 194	L. 225	J. 256	S. 286	M. 317	J. 347
14	D. 14	Mi. 45	Mi. 73	S. 104	L. 134	J. 165	S. 195	M. 226	V. 257	D. 287	Mi. 318	V. 348
15	L. 15	J. 46	J. 74	D. 105	M. 135	V. 166	D. 196	Mi. 227	S. 258	L. 288	J. 319	S. 349
16	M. 16	V. 47	V. 75	L. 106	Mi. 136	S. 167	L. 197	J. 228	D. 259	M. 289	V. 320	D. 350
17	Mi. 17	S. 48	S. 76	M. 107	J. 137	D. 168	M. 198	V. 229	L. 260	Mi. 290	S. 321	L. 351
18	J. 18	D. 49	D. 77	Mi. 108	V. 138	L. 169	Mi. 199	S. 230	M. 261	J. 291	D. 322	M. 352
19	V. 19	L. 50	L. 78	J. 109	S. 139	M. 170	J. 200	D. 231	Mi. 262	V. 292	L. 323	Mi. 353
20	S. 20	M. 51	M. 79	V. 110	D. 140	Mi. 171	V. 201	L. 232	J. 263	S. 293	M. 324	J. 354
21	D. 21	Mi. 52	Mi. 80	S. 111	L. 141	J. 172	S. 202	M. 233	V. 264	D. 294	Mi. 325	V. 355
22	L. 22	J. 53	J. 81	D. 112	M. 142	V. 173	D. 203	Mi. 234	S. 265	L. 295	J. 326	S. 356
23	M. 23	V. 54	V. 82	L. 113	Mi. 143	S. 174	L. 204	J. 235	D. 266	M. 296	V. 327	D. 357
24	Mi. 24	S. 55	S. 83	M. 114	J. 144	D. 175	M. 205	V. 236	L. 267	Mi. 297	S. 328	L. 358
25	J. 25	D. 56	D. 84	Mi. 115	V. 145	L. 176	Mi. 206	S. 237	M. 268	J. 298	D. 329	M. 359
26	V. 26	L. 57	L. 85	J. 116	S. 146	M. 177	J. 207	D. 238	Mi. 269	V. 299	L. 330	Mi. 360
27	S. 27	M. 58	M. 86	V. 117	D. 147	Mi. 178	V. 208	L. 239	J. 270	S. 300	M. 331	J. 361
28	D. 28	Mi. 59	Mi. 87	S. 118	L. 148	J. 179	S. 209	M. 240	V. 271	D. 301	Mi. 332	V. 362
29	L. 29		J. 88	D. 119	M. 149	V. 180	D. 210	Mi. 241	S. 272	L. 302	J. 333	S. 363
30	M. 30		V. 89	L. 120	Mi. 150	S. 181	L. 211	J. 242	D. 273	M. 303	V. 334	D. 364
31	Mi. 31		S. 90		J. 151		M. 212	V. 243		Mi. 304		L. 365

ECLIPSES

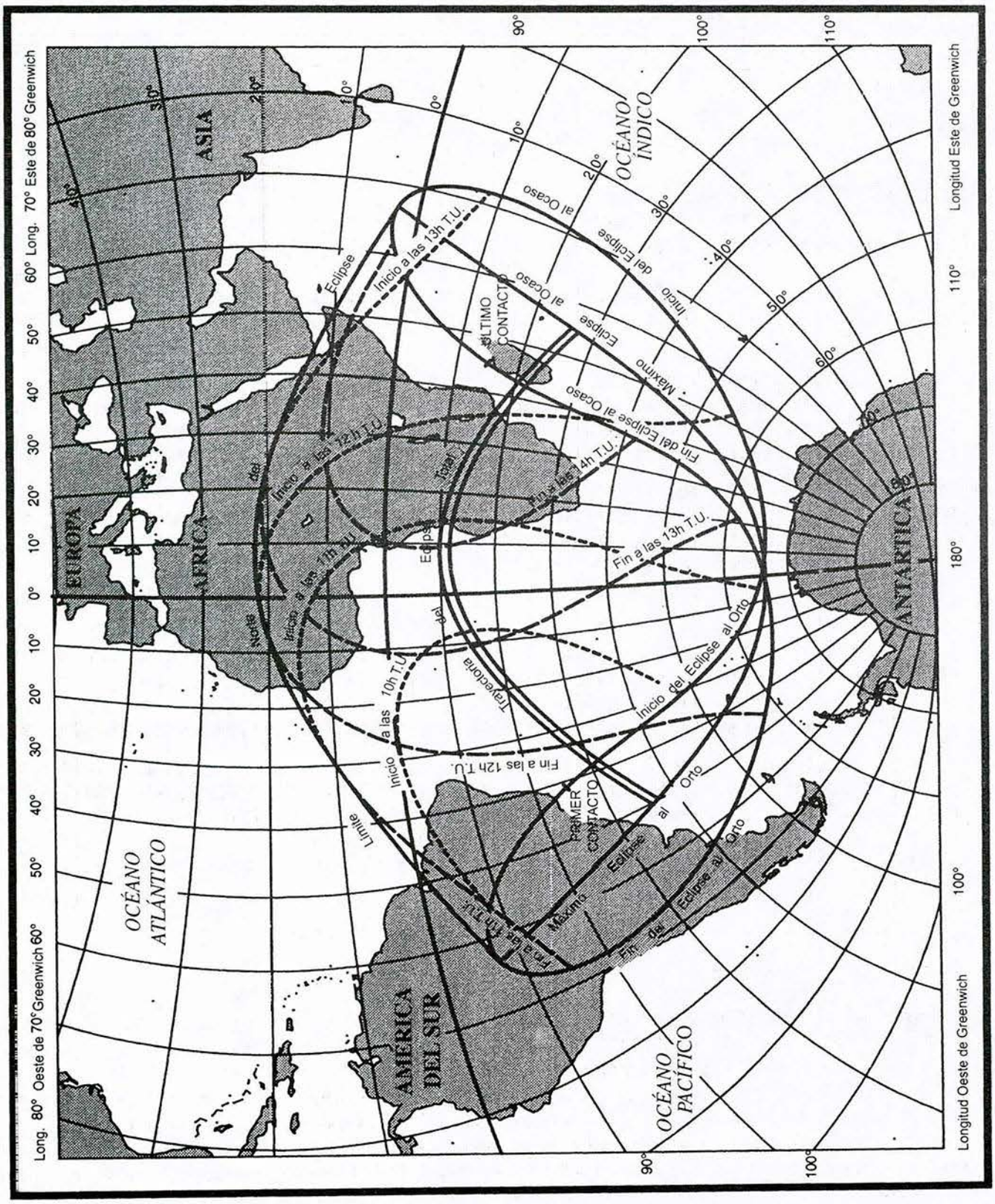
Hay cuatro eclipses, dos de Sol y dos de Luna.

1. *Eclipse total de Luna*, 9 de enero. El eclipse inicia a las $18^h\ 42^m$ y termina a las $21^h\ 59^m$; la fase total inicia a las $19^h\ 50^m$ y termina a las $20^h\ 52^m$. Es visible desde la parte occidental de Australia, Asia, África, Europa, Groenlandia, Norte de Canadá y Norte de Alaska.

2. *Eclipse total de Sol*, 21 de junio. Ver el mapa de la página 6. El eclipse inicia a las $09^h\ 33^m$ y termina a las $14^h\ 34^m$; la fase total inicia a las $10^h\ 37^m$ y termina a las $13^h\ 30^m$. La duración máxima en total es $5^m\ 02^s$.

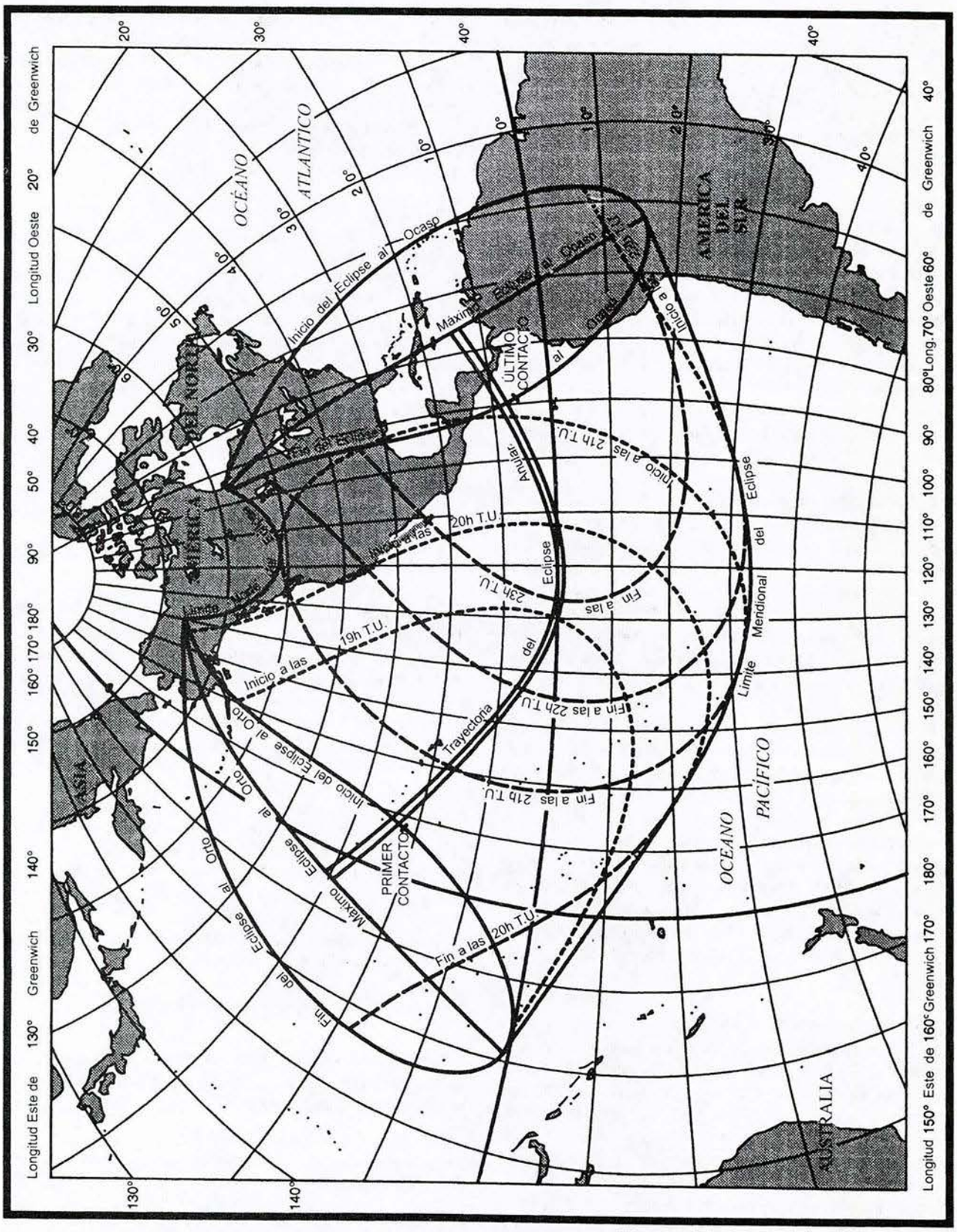
3. *Eclipse parcial de Luna*, 5 de julio. El eclipse inicia a las $13^h\ 35^m$ y termina a las $16^h\ 15^m$. La hora máxima del eclipse son las $14^h\ 55^m$ cuando 0.50 del diámetro de la Luna se obscurece. Es visible desde el Antártico, Nueva Zelanda, Australia, parte oriental y central de Asia, este de África, las islas Hawaianas y el Océano Pacífico central.

4. *Eclipse anular de Sol*, 14 de diciembre. Ver el mapa de la página 7. El eclipse inicia a las $18^h\ 03^m$ y termina a las $23^h\ 41^m$; la fase anular inicia a las $19^h\ 08^m$ y termina a las $22^h\ 34^m$. La duración máxima de la fase anular es $3^m\ 48^s$.



DIAGRAMAS DEL ECLIPSE SOLAR

Las principales características mostradas en los diagramas de arriba son: las trayectorias de los eclipses total y anular; los límites al norte y al sur del eclipse parcial; las curvas del orto y el ocaso; las líneas punteadas muestran las horas de inicio y fin del eclipse parcial a intervalos horarios.



DIAGRAMAS DEL ECLIPSE SOLAR

Detalles más amplios sobre las trayectorias y tiempos del eclipse central son mostrados en *The Astronomical Almanac*.

NOTAS DE LOS PLANETAS, 2001

VISIBILIDAD DE LOS PLANETAS

VENUS es un objeto brillante en el cielo vespertino desde el inicio del año hasta fines de marzo cuando está demasiado cerca del Sol para su observación. A principio de abril reaparece en el cielo matutino, cuando puede observarse hasta pocos días después del inicio de diciembre, cuando otra vez está muy cerca del Sol para su observación. Venus está en conjunción con Mercurio el 6 de abril, con Saturno el 15 de julio y con Júpiter el 6 de agosto.

MARTE puede observarse en el cielo matutino en Virgo poco después de la media noche, se mueve dentro de Libra después de la primera semana de enero y dentro de Escorpión desde la última semana de febrero. Su elongación al oeste aumenta gradualmente, moviéndose dentro de Ophiuchus al inicio de marzo (pasando 5° al N de *Antares* el 4 de marzo), Sagitario en la segunda mitad de abril y regresa a Ophiuchus al inicio de junio. Esta en oposición el 13 de junio cuando es visible en toda la noche. Pasa dentro de Sagitario desde principio de septiembre y solo puede observarse en el cielo vespertino después de mediados de octubre, moviéndose dentro de Capricornio a fines de octubre y en Acuario a principio de diciembre.

JÚPITER está en Tauro al principio del año, y puede verse por más de la media noche hasta cerca de la última semana de febrero después de la cual puede observarse en el cielo vespertino (pasando 5° N de *Aldebaran* el 16 de abril). Al inicio de junio se acerca demasiado al Sol, para ser observado. Reaparece en el cielo matutino a fines de junio moviéndose dentro de Géminis a mediados de julio en cuya constelación permanece por todo el resto del año. Júpiter está en conjunción con Mercurio el 16 de mayo y el 12 de julio y con Venus el 6 de agosto.

SATURNO está en Tauro durante todo el año. Puede verse por mas de la media noche, hasta mediados de febrero después del cual solo puede observarse en el cielo vespertino. Su elongación al este decrece gradualmente y desde principio de la segunda semana de mayo se acercarse demasiado al Sol para ser observado. Reaparece en el cielo matutino a mediados de junio (pasando 4° N de *Aldebaran* el 13 de julio y 17 de diciembre). Esta en oposición el 3 de diciembre, cuando es visible toda la noche. Para el resto del año su elongación al este decrece gradualmente siendo visible por gran parte de la noche. Saturno esta en conjunción con Mercurio el 7 de mayo y con Venus el 15 de julio.

MERCURIO solo puede observarse bajo al este antes del orto, o bajo en el oeste después del ocaso (aproximadamente a la hora en que inicia o termina el crepúsculo civil). Está visible en las mañanas entre las siguientes fechas aproximadas: 19 de febrero (+2.4) al 15 de abril (- 1.2), 26 de junio (+2.8) al 29 de julio (−1.5) y 21 de octubre (+1.4) al 18 de noviembre (−0.9); el planeta es brillante al final de cada período. Es visible al atardecer entre las siguientes fechas aproximadas: 10 de enero (−1.0) al 7 de febrero (+1.8), 1o. de mayo (−1.5) al 7 de junio (+3.0), 15 de agosto (−1.0) al 8 de octubre (+2.2) y 21 de diciembre (−0.8) al 31 de diciembre (−0.8); el planeta es mas brillante al inicio de cada periodo excepto para el último suceso durante el cual es de brillantez comparable. Las cifras en paréntesis son las magnitudes.

DIAGRAMA DE LOS PLANETAS

Descripción General. El diagrama de la página opuesta muestra, en forma gráfica para cualquier fecha del año, la hora media local del paso del Sol por el meridiano, de los cinco planetas: Mercurio, Venus, Marte, Júpiter y Saturno, y a cada 30° de A.H.S.; si el usuario lo desea puede dibujar líneas intermedias correspondientes para algunas estrellas. Se intenta dar un esquema general de disponibilidad de las estrellas y planetas para su observación.

A cada lado de la línea que marca la hora de paso del Sol por el meridiano, se muestra una banda sombreada de 45^m de ancho, para indicar que los planetas y la mayor parte de las estrellas que cruzan el meridiano en un intervalo de 45^m del Sol, estarán demasiado cerca al mismo, para poder ser observados.

Método de uso e interpretación. Para cualquier fecha el diagrama proporciona inmediatamente las horas medias locales del paso por el meridiano del Sol, planetas y estrellas, así como la siguiente información:

a) si un planeta o estrella, está demasiado cerca del Sol para su observación;

b) alguna indicación de su posición en el cielo, especialmente durante el crepúsculo;

c) la proximidad de otros planetas.

Cuando el paso por el meridiano de un planeta exterior ocurre a la media noche, el astro está en oposición al Sol y es visible toda la noche; un planeta puede ser entonces observable durante los crepúsculos matutino y vespertino. A medida que la hora de paso por el meridiano decrece, el astro deja de ser eventualmente observable en la mañana, pero su altitud sobre el horizonte oriental al ocaso aumenta gradualmente; esto continúa hasta que el astro está en el meridiano durante el crepúsculo vespertino. Desde entonces el astro es observable sobre el horizonte poniente y su altitud al ocaso decrece gradualmente; el astro eventualmente llega a estar muy cerca del Sol para poder ser observado. Cuando el astro se hace visible nuevamente se observa bajo en el este durante el crepúsculo matutino; su altitud al orto aumenta hasta que ocurre el paso por el meridiano durante el crepúsculo matutino. Entonces conforme el tiempo de paso por el meridiano decrece a 0^h, el astro es observable en el oeste durante el crepúsculo matutino con una disminución gradual de altitud, hasta que alcance de nuevo la oposición.

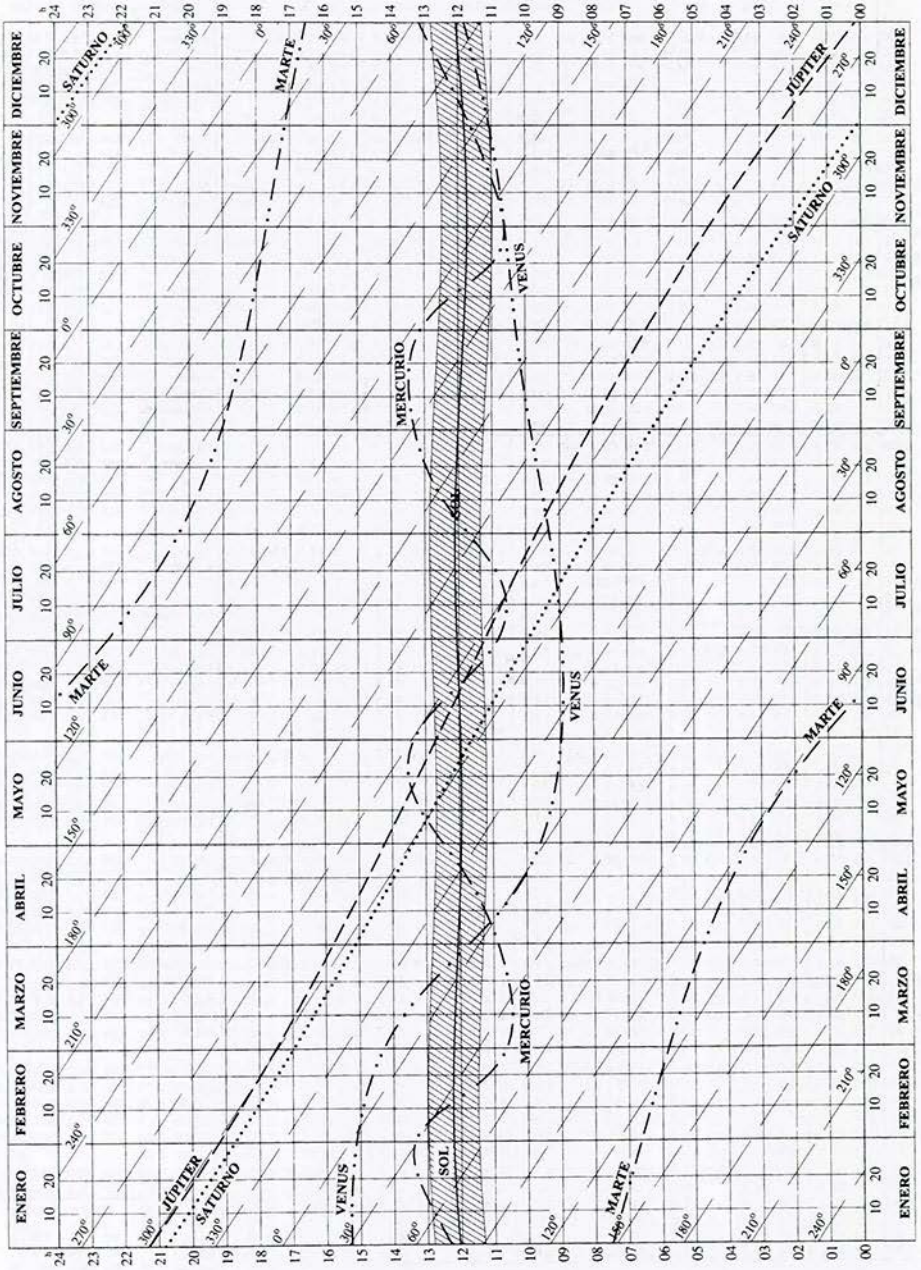
NO CONFUNDIR

Saturno con Mercurio en la primera semana de mayo cuando Mercurio es el astro más brillante, y con Venus a mitad de julio cuando este es el astro más brillante.

Júpiter con Mercurio a mediados de mayo, y de nuevo alrededor de mediados de julio; en ambos casos Júpiter es el astro más brillante.

Venus con Júpiter en la primera mitad de agosto, y con Mercurio al final de la tercera semana de octubre y mediados de noviembre; en ambas ocasiones Venus es el astro más brillante.

TIEMPO MEDIO LOCAL DE PASO POR EL MERIDIANO



T.U.	ARIES	VENUS −4.3		MARTE +1.3		JUPITER −2.7		SATURNO −0.1		ESTRELLAS		
	A.H.G.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.	Nombre	A.H.S.	Dec.
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′		° ′	° ′
4 00	103 40.1	130 51.0	S12 37.1	248 53.5	S12 34.0	43 37.9	N19 46.4	51 00.3	N16 46.0	Acamar	315 25.5	S40 18.4
01	118 42.5	145 50.9	36.0	263 54.5	34.5	58 40.5	46.4	66 02.9	46.0	Achernar	335 33.9	S57 14.3
02	133 45.0	160 50.8	34.9	278 55.6	35.0	73 43.2	46.3	81 05.4	46.0	Acrux	173 20.2	S63 05.9
03	148 47.4	175 50.7	33.8	293 56.6	35.5	88 45.8	46.3	96 08.0	46.0	Adhara	255 19.8	S28 58.5
04	163 49.9	190 50.6	32.6	308 57.7	35.9	103 48.5	46.3	111 10.6	46.0	Aldebaran	291 00.3	N16 30.6
05	178 52.4	205 50.6	31.5	323 58.8	36.4	118 51.1	46.3	126 13.1	46.0			
06	193 54.8	220 50.5	S12 30.4	338 59.8	S12 36.9	133 53.8	N19 46.2	141 15.7	N16 46.0	Alioth	166 29.2	N55 57.1
07	208 57.3	235 50.4	29.3	354 00.9	37.4	148 56.4	46.2	156 18.2	46.0	Alkaid	153 06.7	N49 18.3
J 08	223 59.8	250 50.3	28.1	9 01.9	37.9	163 59.1	46.2	171 20.8	45.9	Al Na'ir	27 56.2	S46 57.6
U 09	239 02.2	265 50.2	27.0	24 03.0	38.3	179 01.7	46.2	186 23.4	45.9	Alnilam	275 55.9	S 1 12.2
10	254 04.7	280 50.1	25.9	39 04.0	38.8	194 04.4	46.1	201 25.9	45.9	Alphard	218 05.4	S 8 39.7
E 11	269 07.2	295 50.0	24.7	54 05.1	39.3	209 07.0	46.1	216 28.5	45.9			
V 12	284 09.6	310 50.0	S12 23.6	69 06.2	S12 39.8	224 09.7	N19 46.1	231 31.1	N16 45.9	Alphecca	126 19.5	N26 42.6
13	299 12.1	325 49.9	22.5	84 07.2	40.3	239 12.3	46.1	246 33.6	45.9	Alpheratz	357 53.7	N29 05.8
E 14	314 14.5	340 49.8	21.4	99 08.3	40.8	254 15.0	46.0	261 36.2	45.9	Altair	62 18.1	N 8 52.2
15	329 17.0	355 49.7	20.2	114 09.3	41.2	269 17.6	46.0	276 38.7	45.9	Ankaa	353 25.3	S42 18.4
S 16	344 19.5	10 49.7	19.1	129 10.4	41.7	284 20.2	46.0	291 41.3	45.8	Antares	112 38.6	S26 25.9
17	359 21.9	25 49.6	18.0	144 11.4	42.2	299 22.9	46.0	306 43.9	45.8			
18	14 24.4	40 49.5	S12 16.8	159 12.5	S12 42.7	314 25.5	N19 45.9	321 46.4	N16 45.8	Arcturus	146 04.8	N19 10.6
19	29 26.9	55 49.4	15.7	174 13.6	43.2	329 28.2	45.9	336 49.0	45.8	Atria	107 49.7	S69 01.5
20	44 29.3	70 49.3	14.6	189 14.6	43.6	344 30.8	45.9	351 51.5	45.8	Avior	234 21.4	S59 30.7
21	59 31.8	85 49.3	13.4	204 15.7	44.1	359 33.5	45.9	6 54.1	45.8	Bellatrix	278 42.2	N 6 20.9
22	74 34.3	100 49.2	12.3	219 16.7	44.6	14 36.1	45.8	21 56.7	45.8	Betelgeuse	271 11.5	N 7 24.4
23	89 36.7	115 49.1	11.2	234 17.8	45.1	29 38.8	45.8	36 59.2	45.8			
5 00	104 39.2	130 49.1	S12 10.0	249 18.9	S12 45.5	44 41.4	N19 45.8	52 01.8	N16 45.8	Canopus	263 59.9	S52 41.9
01	119 41.7	145 49.0	08.9	264 19.9	46.0	59 44.1	45.8	67 04.3	45.7	Capella	280 48.4	N46 00.0
02	134 44.1	160 48.9	07.8	279 21.0	46.5	74 46.7	45.7	82 06.9	45.7	Deneb	49 38.6	N45 17.1
03	149 46.6	175 48.9	06.6	294 22.0	47.0	89 49.3	45.7	97 09.5	45.7	Denebola	182 43.5	N14 34.0
04	164 49.0	190 48.8	05.5	309 23.1	47.5	104 52.0	45.7	112 12.0	45.7	Diphda	349 05.7	S17 59.1
05	179 51.5	205 48.7	04.4	324 24.1	47.9	119 54.6	45.7	127 14.6	45.7			
06	194 54.0	220 48.7	S12 03.2	339 25.2	S12 48.4	134 57.3	N19 45.6	142 17.1	N16 45.7	Dubhe	194 03.2	N61 44.5
07	209 56.4	235 48.6	02.1	354 26.3	48.9	149 59.9	45.6	157 19.7	45.7	Elnath	278 24.6	N28 36.5
08	224 58.9	250 48.5	12 01.0	9 27.3	49.4	165 02.5	45.6	172 22.2	45.7	Eltanin	90 51.2	N51 29.3
V 09	240 01.4	265 48.5	11 59.8	24 28.4	49.9	180 05.2	45.6	187 24.8	45.6	Enif	33 57.0	N 9 52.7
I 10	255 03.8	280 48.4	58.7	39 29.4	50.3	195 07.8	45.6	202 27.4	45.6	Fomalhaut	15 34.9	S29 37.3
E 11	270 06.3	295 48.3	57.6	54 30.5	50.8	210 10.5	45.5	217 29.9	45.6			
R 12	285 08.8	310 48.3	S11 56.4	69 31.5	S12 51.3	225 13.1	N19 45.5	232 32.5	N16 45.6	Gacrux	172 11.8	S57 06.7
N 13	300 11.2	325 48.2	55.3	84 32.6	51.8	240 15.7	45.5	247 35.0	45.6	Gienah	176 02.3	S17 32.7
E 14	315 13.7	340 48.2	54.1	99 33.7	52.2	255 18.4	45.5	262 37.6	45.6	Hadar	149 02.0	S60 22.3
S 15	330 16.2	355 48.1	53.0	114 34.7	52.7	270 21.0	45.4	277 40.1	45.6	Hamal	328 11.7	N23 28.0
16	345 18.6	10 48.1	51.9	129 35.8	53.2	285 23.7	45.4	292 42.7	45.6	Kaus Aust.	83 57.2	S34 23.0
17	0 21.1	25 48.0	50.7	144 36.8	53.7	300 26.3	45.4	307 45.3	45.6			
18	15 23.5	40 47.9	S11 49.6	159 37.9	S12 54.1	315 28.9	N19 45.4	322 47.8	N16 45.6	Kochab	137 20.2	N74 08.9
19	30 26.0	55 47.9	48.4	174 39.0	54.6	330 31.6	45.3	337 50.4	45.5	Markab	13 48.2	N15 12.6
20	45 28.5	70 47.8	47.3	189 40.0	55.1	345 34.2	45.3	352 52.9	45.5	Menkar	314 25.1	N 4 05.5
21	60 30.9	85 47.8	46.2	204 41.1	55.6	0 36.9	45.3	7 55.5	45.5	Menkent	148 19.3	S36 22.2
22	75 33.4	100 47.7	45.0	219 42.1	56.0	15 39.5	45.3	22 58.0	45.5	Miaplacidus	221 41.0	S69 43.1
23	90 35.9	115 47.7	43.9	234 43.2	56.5	30 42.1	45.3	38 00.6	45.5			
6 00	105 38.3	130 47.6	S11 42.7	249 44.2	S12 57.0	45 44.8	N19 45.2	53 03.1	N16 45.5	Mirfak	308 54.1	N49 52.0
01	120 40.8	145 47.6	41.6	264 45.3	57.5	60 47.4	45.2	68 05.7	45.5	Nunki	76 10.8	S26 17.7
02	135 43.3	160 47.5	40.5	279 46.4	57.9	75 50.0	45.2	83 08.3	45.5	Peacock	53 35.1	S56 44.1
03	150 45.7	175 47.5	39.3	294 47.4	58.4	90 52.7	45.2	98 10.8	45.5	Pollux	243 39.3	N28 01.4
04	165 48.2	190 47.4	38.2	309 48.5	58.9	105 55.3	45.1	113 13.4	45.4	Procyon	245 09.6	N 5 13.3
05	180 50.7	205 47.4	37.0	324 49.5	59.4	120 57.9	45.1	128 15.9	45.4			
06	195 53.1	220 47.4	S11 35.9	339 50.6	S12 59.8	136 00.6	N19 45.1	143 18.5	N16 45.4	Rasalhague	96 15.8	N12 33.6
07	210 55.6	235 47.3	34.7	354 51.6	13 00.3	151 03.2	45.1	158 21.0	45.4	Regulus	207 53.6	N11 57.7
S 08	225 58.0	250 47.3	33.6	9 52.7	00.8	166 05.8	45.1	173 23.6	45.4	Rigel	281 21.1	S 8 12.2
A 09	241 00.5	265 47.2	32.4	24 53.8	01.3	181 08.5	45.0	188 26.1	45.4	Rigil Kent.	140 05.5	S60 50.0
B 10	256 03.0	280 47.2	31.3	39 54.8	01.7	196 11.1	45.0	203 28.7	45.4	Sabik	102 24.1	S15 43.5
A 11	271 05.4	295 47.1	30.2	54 55.9	02.2	211 13.7	45.0	218 31.2	45.4			
D 12	286 07.9	310 47.1	S11 29.0	69 56.9	S13 02.7	226 16.4	N19 45.0	233 33.8	N16 45.4	Schedar	349 51.8	N56 32.7
13	301 10.4	325 47.1	27.9	84 58.0	03.2	241 19.0	44.9	248 36.3	45.4	Shaula	96 35.6	S37 06.2
O 14	316 12.8	340 47.0	26.7	99 59.1	03.6	256 21.6	44.9	263 38.9	45.3	Sirius	258 42.0	S16 43.1
15	331 15.3	355 47.0	25.6	115 00.1	04.1	271 24.3	44.9	278 41.5	45.3	Spica	158 41.6	S11 09.8
16	346 17.8	10 47.0	24.4	130 01.2	04.6	286 26.9	44.9	293 44.0	45.3	Suhail	222 59.2	S43 26.1
17	1 20.2	25 46.9	23.3	145 02.2	05.0	301 29.5	44.9	308 46.6	45.3			
18	16 22.7	40 46.9	S11 22.1	160 03.3	S13 05.5	316 32.1	N19 44.8	323 49.1	N16 45.3	Vega	80 46.0	N38 47.1
19	31 25.1	55 46.9	21.0	175 04.3	06.0	331 34.8	44.8	338 51.7	45.3	Zuben'ubi	137 16.4	S16 02.6
20	46 27.6	70 46.8	19.8	190 05.4	06.5	346 37.4	44.8	353 54.2	45.3			
21	61 30.1	85 46.8	18.7	205 06.5	06.9	1 40.0	44.8	8 56.8	45.3		A.H.S.	Pas. Mer.
22	76 32.5	100 46.8	17.5	220 07.5	07.4	16 42.7	44.8	23 59.3	45.3		° ′	h m
23	91 35.0	115 46.7	16.4	235 08.6	07.9	31 45.3	44.7	39 01.9	45.3	Venus	26 09.9	15 17
	h m									Marte	144 39.7	7 22
Pas. Mer.	16 58.6	*v* −0.1	*d* 1.1	*v* 1.1	*d* 0.5	*v* 2.6	*d* 0.0	*v* 2.6	*d* 0.0	Júpiter	300 02.2	20 58
										Saturno	307 22.6	20 28

T.U.	SOL				LUNA						
	A.H.G.		Dec.		A.H.G.	v		Dec.	d	P.H.	
d h	°	′	°	′	°	′	′	°	′	′	′
4 00	178	47.7	S22	44.1	77	27.7	13.3	N 5	15.5	12.2	56.8
01	193	47.4		43.8	92	00.0	13.1	5	27.7	12.1	56.8
02	208	47.1		43.6	106	32.1	13.2	5	39.8	12.1	56.9
03	223	46.9		43.3	121	04.3	13.0	5	51.9	12.1	56.9
04	238	46.6		43.0	135	36.3	13.0	6	04.0	12.1	56.9
05	253	46.3		42.8	150	08.3	12.9	6	16.1	12.1	57.0
06	268	46.0	S22	42.5	164	40.2	12.8	N 6	28.2	12.1	57.0
07	283	45.7		42.2	179	12.0	12.8	6	40.3	12.0	57.1
J 08	298	45.4		42.0	193	43.8	12.7	6	52.3	12.1	57.1
U 09	313	45.2		41.7	208	15.5	12.7	7	04.4	12.0	57.1
E 10	328	44.9		41.4	222	47.2	12.5	7	16.4	12.0	57.2
V 11	343	44.6		41.2	237	18.7	12.5	7	28.4	12.0	57.2
E 12	358	44.3	S22	40.9	251	50.2	12.5	N 7	40.4	11.9	57.3
13	13	44.0		40.6	266	21.7	12.3	7	52.3	12.0	57.3
S 14	28	43.7		40.4	280	53.0	12.3	8	04.3	11.9	57.3
15	43	43.5		40.1	295	24.3	12.2	8	16.2	11.9	57.4
16	58	43.2		39.8	309	55.5	12.1	8	28.1	11.9	57.4
17	73	42.9		39.5	324	26.6	12.1	8	40.0	11.8	57.5
18	88	42.6	S22	39.3	338	57.7	11.9	N 8	51.8	11.8	57.5
19	103	42.3		39.0	353	28.6	11.9	9	03.6	11.8	57.5
20	118	42.1		38.7	7	59.5	11.8	9	15.4	11.8	57.6
21	133	41.8		38.4	22	30.3	11.7	9	27.2	11.7	57.6
22	148	41.5		38.2	37	01.0	11.7	9	38.9	11.7	57.7
23	163	41.2		37.9	51	31.7	11.5	9	50.6	11.7	57.7
5 00	178	40.9	S22	37.6	66	02.2	11.5	N10	02.3	11.6	57.7
01	193	40.7		37.3	80	32.7	11.4	10	13.9	11.6	57.8
02	208	40.4		37.0	95	03.1	11.3	10	25.5	11.6	57.8
03	223	40.1		36.3	109	33.4	11.2	10	37.1	11.5	57.9
04	238	39.8		36.5	124	03.6	11.1	10	48.6	11.5	57.9
05	253	39.5		36.2	138	33.7	11.0	11	00.1	11.4	57.9
06	268	39.3	S22	35.9	153	03.7	11.0	N11	11.5	11.4	58.0
07	283	39.0		35.6	167	33.7	10.8	11	22.9	11.4	58.0
08	298	38.7		35.4	182	03.5	10.8	11	34.3	11.3	58.1
V 09	313	38.4		35.1	196	33.3	10.6	11	45.6	11.3	58.1
I 10	328	38.2		34.8	211	02.9	10.6	11	56.9	11.2	58.1
E 11	343	37.9		34.5	225	32.5	10.5	12	08.1	11.2	58.2
R 12	358	37.6	S22	34.2	240	02.0	10.4	N12	19.2	11.1	58.2
N 13	13	37.3		33.9	254	31.4	10.2	12	30.4	11.1	58.3
E 14	28	37.1		33.6	269	00.6	10.2	12	41.5	11.0	58.3
S 15	43	36.8		33.3	283	29.8	10.1	12	52.5	11.0	58.3
16	58	36.5		33.0	297	58.9	10.0	13	03.5	10.9	58.4
17	73	36.2		32.8	312	27.9	9.9	13	14.4	10.9	58.4
18	88	35.9	S22	32.5	326	56.8	9.8	N13	25.3	10.8	58.5
19	103	35.7		32.2	341	25.6	9.6	13	36.1	10.7	58.5
20	118	35.4		31.9	355	54.2	9.6	13	46.8	10.7	58.5
21	133	35.1		31.6	10	22.8	9.5	13	57.5	10.6	58.6
22	148	34.8		31.3	24	51.3	9.4	14	08.1	10.6	58.6
23	163	34.6		31.0	39	19.7	9.3	14	18.7	10.5	58.7
6 00	178	34.3	S22	30.7	53	48.0	9.1	N14	29.2	10.4	58.7
01	193	34.0		30.4	68	16.1	9.1	14	39.6	10.3	58.8
02	208	33.7		30.1	82	44.2	9.0	14	49.9	10.3	58.8
03	223	33.5		29.8	97	12.2	8.8	15	00.2	10.2	58.8
04	238	33.2		29.5	111	40.0	8.8	15	10.4	10.1	58.9
05	253	32.9		29.2	126	07.8	8.6	15	20.5	10.1	58.9
06	268	32.7	S22	28.9	140	35.4	8.5	N15	30.6	10.0	59.0
07	283	32.4		28.6	155	02.9	8.5	15	40.6	9.9	59.0
S 08	298	32.1		28.3	169	30.4	8.3	15	50.5	9.8	59.0
A 09	313	31.8		28.0	183	57.7	8.2	16	00.3	9.8	59.1
10	328	31.6		27.7	198	24.9	8.1	16	10.1	9.6	59.1
B 11	343	31.3		27.4	212	52.0	8.0	16	19.7	9.6	59.2
A 12	358	31.0	S22	27.1	227	19.0	7.9	N16	29.3	9.5	59.2
13	13	30.7		26.8	241	45.9	7.8	16	38.8	9.4	59.2
D 14	28	30.5		26.5	256	12.7	7.6	16	48.2	9.3	59.3
O 15	43	30.2		26.1	270	39.3	7.6	16	57.5	9.2	59.3
16	58	29.9		25.8	285	05.9	7.4	17	06.7	9.1	59.4
17	73	29.7		25.5	299	32.3	7.4	17	15.8	9.1	59.4
18	88	29.4	S22	25.2	313	58.7	7.2	N17	24.9	8.9	59.4
19	103	29.1		24.9	328	24.9	7.1	17	33.8	8.9	59.5
20	118	28.8		24.6	342	51.0	7.0	17	42.7	8.7	59.5
21	133	28.6		24.3	357	17.0	6.9	17	51.4	8.6	59.5
22	148	28.3		24.0	11	42.9	6.8	18	00.0	8.6	59.6
23	163	28.0		23.6	26	08.7	6.7	N18	08.6	8.4	59.6
	SD	16.3	d	0.3	SD		15.6		15.9		16.1

Lat.	Crepúsculo Náutico	Crepúsculo Civil	Orto Sol	Orto Luna 4	Orto Luna 5	Orto Luna 6	Orto Luna 7
°	h m	h m	h m	h m	h m	h m	h m
N 72	08 19	10 29	▬	11 37	11 14	10 37	▭
N 70	08 01	09 42	▬	11 47	11 35	11 17	10 36
68	07 47	09 12	11 28	11 56	11 51	11 45	11 37
66	07 35	08 49	10 20	12 04	12 04	12 06	12 12
64	07 25	08 31	09 44	12 10	12 15	12 23	12 38
62	07 16	08 16	09 19	12 15	12 24	12 37	12 58
60	07 08	08 04	09 00	12 20	12 32	12 50	13 14
N 58	07 01	07 53	08 43	12 24	12 40	13 00	13 28
56	06 55	07 43	08 30	12 28	12 46	13 09	13 40
54	06 49	07 35	08 18	12 31	12 52	13 17	13 51
52	06 44	07 27	08 07	12 34	12 57	13 25	14 00
50	06 39	07 20	07 58	12 37	13 02	13 31	14 09
45	06 28	07 05	07 38	12 43	13 12	13 45	14 27
N 40	06 18	06 52	07 22	12 48	13 20	13 57	14 41
35	06 09	06 41	07 09	12 53	13 28	14 07	14 54
30	06 01	06 31	06 57	12 57	13 34	14 16	15 05
20	05 45	06 12	06 36	13 04	13 45	14 32	15 24
N 10	05 30	05 56	06 19	13 10	13 55	14 45	15 40
0	05 13	05 39	06 02	13 16	14 05	14 58	15 56
S 10	04 55	05 22	05 45	13 21	14 14	15 11	16 11
20	04 33	05 02	05 27	13 28	14 24	15 25	16 28
30	04 05	04 38	05 05	13 35	14 36	15 40	16 47
35	03 47	04 24	04 53	13 39	14 43	15 50	16 59
40	03 25	04 06	04 39	13 44	14 51	16 00	17 12
45	02 56	03 44	04 21	13 49	15 00	16 13	17 27
S 50	02 14	03 16	04 00	13 56	15 11	16 28	17 46
52	01 49	03 02	03 49	13 59	15 16	16 35	17 55
54	01 13	02 45	03 38	14 03	15 22	16 43	18 05
56	////	02 25	03 24	14 06	15 28	16 52	18 17
58	////	01 59	03 09	14 11	15 35	17 03	18 30
S 60	////	01 19	02 50	14 15	15 43	17 14	18 46

Lat.	Ocaso Sol	Crepúsculo Civil	Crepúsculo Náutico	Ocaso Luna 4	Ocaso Luna 5	Ocaso Luna 6	Ocaso Luna 7
°	h m	h m	h m	h m	h m	h m	h m
N 72	▬	13 42	15 52	02 04	04 06	06 32	▭
N 70	▬	14 29	16 10	01 55	03 48	05 53	08 32
68	12 43	14 59	16 25	01 49	03 33	05 26	07 32
66	13 52	15 22	16 36	01 43	03 21	05 06	06 57
64	14 27	15 40	16 47	01 38	03 12	04 50	06 32
62	14 52	15 55	16 55	01 34	03 03	04 37	06 13
60	15 12	16 07	17 03	01 31	02 56	04 26	05 57
N 58	15 28	16 18	17 10	01 28	02 50	04 16	05 44
56	15 42	16 28	17 16	01 25	02 44	04 07	05 32
54	15 54	16 37	17 22	01 23	02 40	04 00	05 22
52	16 04	16 44	17 27	01 20	02 35	03 53	05 13
50	16 13	16 51	17 32	01 18	02 31	03 47	05 05
45	16 33	17 06	17 43	01 14	02 22	03 34	04 48
N 40	16 49	17 19	17 53	01 10	02 15	03 23	04 34
35	17 03	17 30	18 02	01 07	02 09	03 14	04 22
30	17 14	17 41	18 10	01 04	02 04	03 06	04 12
20	17 35	17 59	18 26	00 59	01 54	02 53	03 55
N 10	17 52	18 15	18 41	00 55	01 46	02 41	03 39
0	18 09	18 32	18 58	00 51	01 39	02 29	03 25
S 10	18 26	18 49	19 16	00 47	01 31	02 18	03 11
20	18 44	19 09	19 38	00 43	01 23	02 06	02 55
30	19 05	19 33	20 05	00 38	01 14	01 53	02 38
35	19 18	19 47	20 23	00 36	01 08	01 45	02 28
40	19 32	20 05	20 45	00 32	01 02	01 36	02 16
45	19 49	20 26	21 14	00 29	00 55	01 26	02 03
S 50	20 11	20 54	21 56	00 25	00 47	01 14	01 46
52	20 21	21 08	22 20	00 23	00 43	01 08	01 39
54	20 32	21 25	22 56	00 20	00 39	01 01	01 30
56	20 46	21 45	////	00 18	00 34	00 54	01 21
58	21 01	22 11	////	00 15	00 29	00 46	01 10
S 60	21 20	22 49	////	00 13	00 23	00 38	00 57

Dia	SOL E.T. (−) 00h	SOL E.T. (−) 12h	SOL Pas. Mer.	LUNA Pas. Mer. Sup.	LUNA Pas. Mer. Inf.	LUNA Edad	LUNA Fase
d	m s	m s	h m	h m	h m	d %	
4	04 49	05 02	12 05	19 27	07 03	10 66	
5	05 16	05 29	12 05	20 17	07 51	11 76	◐
6	05 42	05 55	12 06	21 11	08 44	12 85	

T.U.	ARIES	VENUS −4.4		MARTE +1.3		JUPITER −2.7		SATURNO +0.0		ESTRELLAS		
	A.H.G.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.	Nombre	A.H.S.	Dec.
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′		° ′	° ′
7 00	106 37.5	130 46.7	S11 15.2	250 09.6	S13 08.3	46 47.9	N19 44.7	54 04.4	N16 45.3	Acamar	315 25.5	S40 18.4
01	121 39.9	145 46.7	14.1	265 10.7	08.8	61 50.5	44.7	69 07.0	45.2	Achernar	335 33.9	S57 14.3
02	136 42.4	160 46.7	12.9	280 11.7	09.3	76 53.2	44.7	84 09.5	45.2	Acrux	173 20.2	S63 05.9
03	151 44.9	175 46.6 . .	11.8	295 12.8 . .	09.8	91 55.8 . .	44.7	99 12.1 . .	45.2	Adhara	255 19.8	S28 58.5
04	166 47.3	190 46.6	10.6	310 13.9	10.2	106 58.4	44.6	114 14.6	45.2	Aldebaran	291 00.3	N16 30.6
05	181 49.8	205 46.6	09.5	325 14.9	10.7	122 01.0	44.6	129 17.2	45.2			
06	196 52.3	220 46.6	S11 08.3	340 16.0	S13 11.2	137 03.7	N19 44.6	144 19.7	N16 45.2	Alioth	166 29.1	N55 57.1
07	211 54.7	235 46.5	07.2	355 17.0	11.6	152 06.3	44.6	159 22.3	45.2	Alkaid	153 06.6	N49 18.3
D 08	226 57.2	250 46.5	06.0	10 18.1	12.1	167 08.9	44.5	174 24.8	45.2	Al Na'ir	27 56.2	S46 57.6
O 09	241 59.6	265 46.5 . .	04.8	25 19.2 . .	12.6	182 11.5 . .	44.5	189 27.4 . .	45.2	Alnilam	275 55.9	S 1 12.2
M 10	257 02.1	280 46.5	03.7	40 20.2	13.1	197 14.2	44.5	204 29.9	45.2	Alphard	218 05.4	S 8 39.7
I 11	272 04.6	295 46.5	02.5	55 21.3	13.5	212 16.8	44.5	219 32.5	45.2			
N 12	287 07.0	310 46.4	S11 01.4	70 22.3	S13 14.0	227 19.4	N19 44.5	234 35.0	N16 45.1	Alphecca	126 19.5	N26 42.6
G 13	302 09.5	325 46.4	11 00.2	85 23.4	14.5	242 22.0	44.4	249 37.6	45.1	Alpheratz	357 53.7	N29 05.8
O 14	317 12.0	340 46.4	10 59.1	100 24.4	14.9	257 24.7	44.4	264 40.1	45.1	Altair	62 18.1	N 8 52.2
15	332 14.4	355 46.4 . .	57.9	115 25.5 . .	15.4	272 27.3 . .	44.4	279 42.7 . .	45.1	Ankaa	353 25.3	S42 18.4
16	347 16.9	10 46.4	56.8	130 26.6	15.9	287 29.9	44.4	294 45.2	45.1	Antares	112 38.5	S26 25.9
17	2 19.4	25 46.4	55.6	145 27.6	16.3	302 32.5	44.4	309 47.7	45.1			
18	17 21.8	40 46.4	S10 54.4	160 28.7	S13 16.8	317 35.1	N19 44.3	324 50.3	N16 45.1	Arcturus	146 04.7	N19 10.6
19	32 24.3	55 46.3	53.3	175 29.7	17.3	332 37.8	44.3	339 52.8	45.1	Atria	107 49.7	S69 01.5
20	47 26.8	70 46.3	52.1	190 30.8	17.7	347 40.4	44.3	354 55.4	45.1	Avior	234 21.4	S59 30.7
21	62 29.2	85 46.3 . .	51.0	205 31.8 . .	18.2	2 43.0 . .	44.3	9 57.9 . .	45.1	Bellatrix	278 42.2	N 6 20.9
22	77 31.7	100 46.3	49.8	220 32.9	18.7	17 45.6	44.3	25 00.5	45.1	Betelgeuse	271 11.5	N 7 24.3
23	92 34.1	115 46.3	48.7	235 34.0	19.1	32 48.2	44.3	40 03.0	45.0			
8 00	107 36.6	130 46.3	S10 47.5	250 35.0	S13 19.6	47 50.9	N19 44.2	55 05.6	N16 45.0	Canopus	263 59.9	S52 41.9
01	122 39.1	145 46.3	46.3	265 36.1	20.1	62 53.5	44.2	70 08.1	45.0	Capella	280 48.4	N46 00.0
02	137 41.5	160 46.3	45.2	280 37.1	20.5	77 56.1	44.2	85 10.7	45.0	Deneb	49 38.6	N45 17.1
03	152 44.0	175 46.3 . .	44.0	295 38.2 . .	21.0	92 58.7 . .	44.2	100 13.2 . .	45.0	Denebola	182 43.5	N14 34.0
04	167 46.5	190 46.3	42.9	310 39.3	21.5	108 01.3	44.2	115 15.8	45.0	Diphda	349 05.7	S17 59.1
05	182 48.9	205 46.3	41.7	325 40.3	21.9	123 04.0	44.1	130 18.3	45.0			
06	197 51.4	220 46.3	S10 40.5	340 41.4	S13 22.4	138 06.6	N19 44.1	145 20.8	N16 45.0	Dubhe	194 03.2	N61 44.5
07	212 53.9	235 46.3	39.4	355 42.4	22.9	153 09.2	44.1	160 23.4	45.0	Elnath	278 24.6	N28 36.5
08	227 56.3	250 46.3	38.2	10 43.5	23.3	168 11.8	44.1	175 25.9	45.0	Eltanin	90 51.2	N51 29.3
L 09	242 58.8	265 46.3 . .	37.1	25 44.5 . .	23.8	183 14.4 . .	44.1	190 28.5 . .	45.0	Enif	33 57.0	N 9 52.7
U 10	258 01.3	280 46.3	35.9	40 45.6	24.3	198 17.0	44.0	205 31.0	45.0	Fomalhaut	15 34.9	S29 37.3
N 11	273 03.7	295 46.3	34.7	55 46.7	24.7	213 19.6	44.0	220 33.6	45.0			
E 12	288 06.2	310 46.3	S10 33.6	70 47.7	S13 25.2	228 22.3	N19 44.0	235 36.1	N16 44.9	Gacrux	172 11.8	S57 06.8
S 13	303 08.6	325 46.3	32.4	85 48.8	25.7	243 24.9	44.0	250 38.7	44.9	Gienah	176 02.3	S17 32.7
14	318 11.1	340 46.3	31.2	100 49.8	26.1	258 27.5	44.0	265 41.2	44.9	Hadar	149 02.0	S60 22.3
15	333 13.6	355 46.3 . .	30.1	115 50.9 . .	26.6	273 30.1 . .	43.9	280 43.7 . .	44.9	Hamal	328 11.7	N23 28.0
16	348 16.0	10 46.3	28.9	130 51.9	27.1	288 32.7	43.9	295 46.3	44.9	Kaus Aust.	83 57.1	S34 23.0
17	3 18.5	25 46.3	27.7	145 53.0	27.5	303 35.3	43.9	310 48.8	44.9			
18	18 21.0	40 46.3	S10 26.6	160 54.1	S13 28.0	318 37.9	N19 43.9	325 51.4	N16 44.9	Kochab	137 20.1	N74 08.9
19	33 23.4	55 46.3	25.4	175 55.1	28.5	333 40.6	43.9	340 53.9	44.9	Markab	13 48.2	N15 12.6
20	48 25.9	70 46.4	24.3	190 56.2	28.9	348 43.2	43.9	355 56.5	44.9	Menkar	314 25.1	N 4 05.5
21	63 28.4	85 46.4 . .	23.1	205 57.2 . .	29.4	3 45.8 . .	43.8	10 59.0 . .	44.9	Menkent	148 19.2	S36 22.2
22	78 30.8	100 46.4	21.9	220 58.3	29.8	18 48.4	43.8	26 01.5	44.9	Miaplacidus	221 41.0	S69 43.1
23	93 33.3	115 46.4	20.8	235 59.4	30.3	33 51.0	43.8	41 04.1	44.9			
9 00	108 35.8	130 46.4	S10 19.6	251 00.4	S13 30.8	48 53.6	N19 43.8	56 06.6	N16 44.9	Mirfak	308 54.1	N49 52.0
01	123 38.2	145 46.4	18.4	266 01.5	31.2	63 56.2	43.8	71 09.2	44.9	Nunki	76 10.8	S26 17.7
02	138 40.7	160 46.4	17.3	281 02.5	31.7	78 58.8	43.8	86 11.7	44.8	Peacock	53 35.1	S56 44.0
03	153 43.1	175 46.5 . .	16.1	296 03.6 . .	32.2	94 01.4 . .	43.7	101 14.3 . .	44.8	Pollux	243 39.2	N28 01.4
04	168 45.6	190 46.5	14.9	311 04.6	32.6	109 04.1	43.7	116 16.8	44.8	Procyon	245 09.6	N 5 13.3
05	183 48.1	205 46.5	13.8	326 05.7	33.1	124 06.7	43.7	131 19.3	44.8			
06	198 50.5	220 46.5	S10 12.6	341 06.8	S13 33.6	139 09.3	N19 43.7	146 21.9	N16 44.8	Rasalhague	96 15.8	N12 33.5
07	213 53.0	235 46.5	11.4	356 07.8	34.0	154 11.9	43.7	161 24.4	44.8	Regulus	207 53.6	N11 57.7
M 08	228 55.5	250 46.6	10.2	11 08.9	34.5	169 14.5	43.6	176 27.0	44.8	Rigel	281 21.1	S 8 12.2
A 09	243 57.9	265 46.6 . .	09.1	26 09.9 . .	34.9	184 17.1 . .	43.6	191 29.5 . .	44.8	Rigil Kent.	140 05.5	S60 50.0
R 10	259 00.4	280 46.6	07.9	41 11.0	35.4	199 19.7	43.6	206 32.0	44.8	Sabik	102 24.0	S15 43.5
T 11	274 02.9	295 46.6	06.7	56 12.1	35.9	214 22.3	43.6	221 34.6	44.8			
12	289 05.3	310 46.7	S10 05.6	71 13.1	S13 36.3	229 24.9	N19 43.6	236 37.1	N16 44.8	Schedar	349 51.8	N56 32.7
E 13	304 07.8	325 46.7	04.4	86 14.2	36.8	244 27.5	43.6	251 39.7	44.8	Shaula	96 35.5	S37 06.2
S 14	319 10.3	340 46.7	03.2	101 15.2	37.2	259 30.1	43.5	266 42.2	44.8	Sirius	258 42.0	S16 43.1
15	334 12.7	355 46.7 . .	02.1	116 16.3 . .	37.7	274 32.7 . .	43.5	281 44.7 . .	44.8	Spica	158 41.6	S11 09.9
16	349 15.2	10 46.8	10 00.9	131 17.3	38.2	289 35.3	43.5	296 47.3	44.8	Suhail	222 59.2	S43 26.1
17	4 17.6	25 46.8	9 59.7	146 18.4	38.6	304 37.9	43.5	311 49.8	44.7			
18	19 20.1	40 46.8	S 9 58.5	161 19.5	S13 39.1	319 40.5	N19 43.5	326 52.4	N16 44.7	Vega	80 46.0	N38 47.0
19	34 22.6	55 46.9	57.4	176 20.5	39.6	334 43.1	43.5	341 54.9	44.7	Zuben'ubi	137 16.4	S16 02.6
20	49 25.0	70 46.9	56.2	191 21.6	40.0	349 45.8	43.4	356 57.4	44.7			
21	64 27.5	85 46.9 . .	55.0	206 22.6 . .	40.5	4 48.4 . .	43.4	12 00.0 . .	44.7		A.H.S.	Pas. Mer.
22	79 30.0	100 47.0	53.9	221 23.7	40.9	19 51.0	43.4	27 02.5	44.7		° ′	h m
23	94 32.4	115 47.0	52.7	236 24.8	41.4	34 53.6	43.4	42 05.0	44.7	Venus	23 09.7	15 17
	h m									Marte	142 58.4	7 17
Pas. Mer.	16 46.8	v 0.0	d 1.2	v 1.1	d 0.5	v 2.6	d 0.0	v 2.5	d 0.0	Júpiter	300 14.3	20 45
										Saturno	307 29.0	20 16

T.U.	SOL A.H.G.	SOL Dec.	LUNA A.H.G.	v	LUNA Dec.	d
d h	° ′	° ′	° ′	′	° ′	′
7 00	178 27.8	S22 23.3	40 34.4	6.6	N18 17.0	8.3 59.7
01	193 27.5	23.0	55 00.0	6.5	18 25.3	8.2 59.7
02	208 27.2	22.7	69 25.5	6.3	18 33.5	8.1 59.7
03	223 27.0	22.4	83 50.8	6.3	18 41.6	8.0 59.8
04	238 26.7	22.1	98 16.1	6.1	18 49.6	7.9 59.8
05	253 26.4	21.7	112 41.2	6.1	18 57.5	7.8 59.8
06	268 26.2	S22 21.4	127 06.3	5.9	N19 05.3	7.6 59.9
07	283 25.9	21.1	141 31.2	5.8	19 12.9	7.6 59.9
08	298 25.6	20.8	155 56.0	5.8	19 20.5	7.4 60.0
D 09	313 25.4	20.5	170 20.8	5.6	19 27.9	7.3 60.0
O 10	328 25.1	20.1	184 45.4	5.5	19 35.2	7.1 60.0
M 11	343 24.8	19.8	199 09.9	5.4	19 42.3	7.1 60.1
I 12	358 24.6	S22 19.5	213 34.3	5.3	N19 49.4	6.9 60.1
N 13	13 24.3	19.2	227 58.6	5.2	19 56.3	6.8 60.1
G 14	28 24.0	18.8	242 22.8	5.2	20 03.1	6.6 60.2
O 15	43 23.8	18.5	256 47.0	5.0	20 09.7	6.6 60.2
16	58 23.5	18.2	271 11.0	4.9	20 16.3	6.4 60.2
17	73 23.2	17.8	285 34.9	4.8	20 22.7	6.2 60.3
18	88 23.0	S22 17.5	299 58.7	4.7	N20 28.9	6.1 60.3
19	103 22.7	17.2	314 22.4	4.6	20 35.0	6.0 60.3
20	118 22.4	16.9	328 46.0	4.6	20 41.0	5.9 60.4
21	133 22.2	16.5	343 09.6	4.4	20 46.9	5.7 60.4
22	148 21.9	16.2	357 33.0	4.4	20 52.6	5.6 60.4
23	163 21.6	15.9	11 56.4	4.2	20 58.2	5.4 60.5
8 00	178 21.4	S22 15.5	26 19.6	4.2	N21 03.6	5.3 60.5
01	193 21.1	15.2	40 42.8	4.1	21 08.9	5.1 60.5
02	208 20.8	14.9	55 05.9	4.0	21 14.0	5.0 60.5
03	223 20.6	14.5	69 28.9	3.9	21 19.0	4.8 60.6
04	238 20.3	14.2	83 51.8	3.8	21 23.8	4.7 60.6
05	253 20.0	13.8	98 14.6	3.7	21 28.5	4.5 60.6
06	268 19.8	S22 13.5	112 37.3	3.7	N21 33.0	4.4 60.7
07	283 19.5	13.2	127 00.0	3.6	21 37.4	4.3 60.7
08	298 19.3	12.8	141 22.6	3.5	21 41.7	4.0 60.7
L 09	313 19.0	12.5	155 45.1	3.5	21 45.7	3.9 60.7
U 10	328 18.7	12.2	170 07.6	3.3	21 49.6	3.8 60.8
N 11	343 18.5	11.8	184 29.9	3.3	21 53.4	3.6 60.8
E 12	358 18.2	S22 11.5	198 52.2	3.3	N21 57.0	3.4 60.8
S 13	13 18.0	11.1	213 14.5	3.1	22 00.4	3.3 60.8
14	28 17.7	10.8	227 36.6	3.1	22 03.7	3.1 60.9
15	43 17.4	10.4	241 58.7	3.1	22 06.8	3.0 60.9
16	58 17.2	10.1	256 20.8	3.0	22 09.8	2.8 60.9
17	73 16.9	09.7	270 42.8	2.9	22 12.6	2.6 60.9
18	88 16.6	S22 09.4	285 04.7	2.8	N22 15.2	2.5 61.0
19	103 16.4	09.0	299 26.5	2.9	22 17.7	2.3 61.0
20	118 16.1	08.7	313 48.4	2.7	22 20.0	2.1 61.0
21	133 15.9	08.3	328 10.1	2.7	22 22.1	1.9 61.0
22	148 15.6	08.0	342 31.8	2.7	22 24.0	1.8 61.0
23	163 15.4	07.6	356 53.5	2.6	22 25.8	1.7 61.1
9 00	178 15.1	S22 07.3	11 15.1	2.6	N22 27.5	1.4 61.1
01	193 14.8	06.9	25 36.7	2.6	22 28.9	1.3 61.1
02	208 14.6	06.6	39 58.3	2.5	22 30.2	1.1 61.1
03	223 14.3	06.2	54 19.8	2.4	22 31.3	0.9 61.1
04	238 14.1	05.9	68 41.2	2.5	22 32.2	0.8 61.2
05	253 13.8	05.5	83 02.7	2.4	22 33.0	0.6 61.2
06	268 13.5	S22 05.2	97 24.1	2.4	N22 33.6	0.4 61.2
07	283 13.3	04.8	111 45.5	2.3	22 34.0	0.2 61.2
M 08	298 13.0	04.5	126 06.8	2.4	22 34.2	0.1 61.2
09	313 12.8	04.1	140 28.2	2.3	22 34.3	0.1 61.2
A 10	328 12.5	03.7	154 49.5	2.3	22 34.2	0.3 61.2
R 11	343 12.3	03.4	169 10.8	2.3	22 33.9	0.5 61.3
T 12	358 12.0	S22 03.0	183 32.1	2.2	N22 33.4	0.6 61.3
E 13	13 11.8	02.6	197 53.3	2.3	22 32.8	0.8 61.3
S 14	28 11.5	02.3	212 14.6	2.3	22 32.0	1.0 61.3
15	43 11.2	01.9	226 35.9	2.2	22 31.0	1.2 61.3
16	58 11.0	01.6	240 57.1	2.3	22 29.8	1.3 61.3
17	73 10.7	01.2	255 18.4	2.2	22 28.5	1.5 61.3
18	88 10.5	S22 00.8	269 39.6	2.3	N22 27.0	1.7 61.3
19	103 10.2	00.5	284 00.9	2.3	22 25.3	1.9 61.3
20	118 10.0	22 00.1	298 22.2	2.2	22 23.4	2.0 61.3
21	133 09.7	21 59.7	312 43.4	2.3	22 21.4	2.2 61.4
22	148 09.5	59.4	327 04.7	2.3	22 19.2	2.4 61.4
23	163 09.2	59.0	341 26.0	2.3	N22 16.8	2.5 61.4
	SD 16.3	d 0.3	SD 16.4		16.6	16.7

Lat.	Crepúsculo Naútico	Crepúsculo Civil	Orto Sol
°	h m	h m	h m
N 72	08 15	10 19	▬
N 70	07 58	09 36	▬
68	07 44	09 07	11 09
66	07 32	08 46	10 12
64	07 23	08 28	09 40
62	07 14	08 14	09 16
60	07 07	08 02	08 57
N 58	07 00	07 51	08 41
56	06 54	07 42	08 28
54	06 48	07 34	08 16
52	06 43	07 26	08 06
50	06 38	07 19	07 57
45	06 28	07 04	07 38
N 40	06 18	06 52	07 22
35	06 09	06 41	07 09
30	06 01	06 31	06 57
20	05 46	06 13	06 37
N 10	05 31	05 57	06 20
0	05 15	05 41	06 03
S 10	04 57	05 24	05 46
20	04 35	05 04	05 29
30	04 08	04 41	05 08
35	03 50	04 26	04 56
40	03 29	04 09	04 41
45	03 00	03 48	04 25
S 50	02 19	03 21	04 04
52	01 56	03 07	03 53
54	01 23	02 51	03 42
56	////	02 31	03 29
58	////	02 06	03 14
S 60	////	01 30	02 56

Orto Luna 7	8	9	10
h m	h m	h m	h m
▭	▭	▭	▭
10 36	▭	▭	▭
11 37	11 20	▭	13 59
12 12	12 30	13 19	14 55
12 38	13 06	14 01	15 28
12 58	13 33	14 30	15 53
13 14	13 53	14 52	16 12
13 28	14 10	15 10	16 28
13 40	14 24	15 25	16 42
13 51	14 37	15 38	16 53
14 00	14 48	15 49	17 04
14 09	14 57	15 59	17 13
14 27	15 18	16 20	17 32
14 41	15 35	16 38	17 48
14 54	15 49	16 52	18 02
15 05	16 01	17 05	18 13
15 24	16 22	17 26	18 33
15 40	16 41	17 45	18 50
15 56	16 58	18 02	19 06
16 11	17 15	18 20	19 23
16 28	17 34	18 38	19 40
16 47	17 55	19 00	19 59
16 59	18 08	19 13	20 11
17 12	18 22	19 27	20 24
17 27	18 39	19 44	20 40
17 46	19 01	20 06	20 59
17 55	19 11	20 16	21 08
18 05	19 22	20 27	21 18
18 17	19 35	20 40	21 29
18 30	19 51	20 56	21 42
18 46	20 09	21 13	21 57

Lat.	Ocaso Sol	Crepúsculo Civil	Crepúsculo Náutico
°	h m	h m	h m
N 72	▬	13 56	16 00
N 70	▬	14 38	16 17
68	13 06	15 07	16 30
66	14 02	15 28	16 42
64	14 34	15 46	16 51
62	14 58	16 00	17 00
60	15 17	16 12	17 07
N 58	15 33	16 23	17 14
56	15 46	16 32	17 20
54	15 58	16 40	17 26
52	16 08	16 48	17 31
50	16 17	16 55	17 36
45	16 36	17 10	17 46
N 40	16 52	17 22	17 56
35	17 05	17 33	18 04
30	17 17	17 43	18 12
20	17 37	18 00	18 28
N 10	17 54	18 17	18 43
0	18 10	18 33	18 59
S 10	18 27	18 50	19 17
20	18 45	19 09	19 38
30	19 06	19 33	20 05
35	19 18	19 47	20 23
40	19 32	20 04	20 44
45	19 49	20 25	21 13
S 50	20 09	20 52	21 53
52	20 19	21 06	22 16
54	20 31	21 22	22 48
56	20 44	21 41	////
58	20 59	22 06	////
S 60	21 17	22 41	////

Ocaso Luna 7	8	9	10
h m	h m	h m	h m
▭	▭	▭	▭
08 32	▭	▭	▭
09 57	▭	▭	11 48
08 47	10 12	10 52	
08 11	09 30	10 18	
07 45	09 01	09 53	
07 25	08 39	09 33	
07 08	08 21	09 17	
06 54	08 06	09 03	
06 42	07 53	08 51	
06 31	07 42	08 41	
06 22	07 32	08 31	
06 02	07 10	08 11	
05 45	06 53	07 55	
05 32	06 39	07 41	
05 20	06 26	07 29	
04 59	06 05	07 08	
04 41	05 46	06 50	
04 25	05 28	06 33	
04 08	05 11	06 16	
03 51	04 52	05 58	
03 30	04 30	05 37	
03 18	04 17	05 24	
03 05	04 03	05 10	
02 49	03 45	04 53	
02 29	03 24	04 32	
02 20	03 14	04 22	
02 09	03 02	04 11	
01 57	02 49	03 58	
01 44	02 33	03 43	
01 28	02 15	03 25	

Día	SOL E.T.(−) 00h	SOL E.T.(−) 12h	SOL Pas. Mer.	LUNA Pas. Mer. Sup.	LUNA Pas. Mer. Inf.	LUNA Edad	LUNA Fase
d	m s	m s	h m	h m	h m	d	%
7	06 08	06 21	12 06	22 10	09 40	13	92
8	06 34	06 47	12 07	23 13	10 41	14	97
9	06 59	07 11	12 07	24 18	11 45	15	100

T.U.	ARIES	VENUS −4.4		MARTE +1.2		JUPITER −2.6		SATURNO +0.0	
	A.H.G.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
13 00	112 32.3	130 52.0	S 8 26.4	252 42.0	S14 14.5	53 02.6	N19 42.4	60 09.8	N16 44.4
01	127 34.8	145 52.1	25.2	267 43.1	14.9	68 05.2	42.4	75 12.3	44.4
02	142 37.2	160 52.2	24.0	282 44.1	15.4	83 07.7	42.4	90 14.8	44.4
03	157 39.7	175 52.3	. . 22.8	297 45.2	. . 15.8	98 10.3	. . 42.4	105 17.4	. . 44.4
04	172 42.2	190 52.4	21.6	312 46.3	16.3	113 12.9	42.4	120 19.9	44.4
05	187 44.6	205 52.5	20.4	327 47.3	16.7	128 15.5	42.4	135 22.4	44.4
06	202 47.1	220 52.6	S 8 19.2	342 48.4	S14 17.2	143 18.0	N19 42.3	150 24.9	N16 44.4
07	217 49.6	235 52.7	18.1	357 49.4	17.6	158 20.6	42.3	165 27.4	44.4
S 08	232 52.0	250 52.8	16.9	12 50.5	18.1	173 23.2	42.3	180 30.0	44.4
A 09	247 54.5	265 52.9	. . 15.7	27 51.6	. . 18.5	188 25.8	. . 42.3	195 32.5	. . 44.4
10	262 57.0	280 53.0	14.5	42 52.6	19.0	203 28.3	42.3	210 35.0	44.4
B 11	277 59.4	295 53.2	13.3	57 53.7	19.4	218 30.9	42.3	225 37.5	44.4
A 12	293 01.9	310 53.3	S 8 12.1	72 54.7	S14 19.9	233 33.5	N19 42.3	240 40.1	N16 44.4
13	308 04.3	325 53.4	10.9	87 55.8	20.3	248 36.0	42.3	255 42.6	44.4
D 14	323 06.8	340 53.5	09.7	102 56.8	20.7	263 38.6	42.3	270 45.1	44.4
O 15	338 09.3	355 53.6	. . 08.5	117 57.9	. . 21.2	278 41.2	. . 42.2	285 47.6	. . 44.4
16	353 11.7	10 53.7	07.3	132 59.0	21.6	293 43.8	42.2	300 50.1	44.4
17	8 14.2	25 53.8	06.1	148 00.0	22.1	308 46.3	42.2	315 52.7	44.4
18	23 16.7	40 54.0	S 8 04.9	163 01.1	S14 22.5	323 48.9	N19 42.2	330 55.2	N16 44.4
19	38 19.1	55 54.1	03.7	178 02.1	23.0	338 51.5	42.2	345 57.7	44.4
20	53 21.6	70 54.2	02.5	193 03.2	23.4	353 54.0	42.2	1 00.2	44.4
21	68 24.1	85 54.3	. . 01.3	208 04.3	. . 23.9	8 56.6	. . 42.2	16 02.7	. . 44.4
22	83 26.5	100 54.4	8 00.2	223 05.3	24.3	23 59.2	42.2	31 05.3	44.4
23	98 29.0	115 54.6	7 59.0	238 06.4	24.7	39 01.7	42.2	46 07.8	44.4
14 00	113 31.5	130 54.7	S 7 57.8	253 07.4	S14 25.2	54 04.3	N19 42.2	61 10.3	N16 44.4
01	128 33.9	145 54.8	56.6	268 08.5	25.6	69 06.9	42.2	76 12.8	44.4
02	143 36.4	160 54.9	55.4	283 09.6	26.1	84 09.4	42.1	91 15.3	44.4
03	158 38.8	175 55.1	. . 54.2	298 10.6	. . 26.5	99 12.0	. . 42.1	106 17.9	. . 44.4
04	173 41.3	190 55.2	53.0	313 11.7	27.0	114 14.6	42.1	121 20.4	44.4
05	188 43.8	205 55.3	51.8	328 12.7	27.4	129 17.1	42.1	136 22.9	44.4
06	203 46.2	220 55.4	S 7 50.6	343 13.8	S14 27.8	144 19.7	N19 42.1	151 25.4	N16 44.4
07	218 48.7	235 55.6	49.4	358 14.8	28.3	159 22.3	42.1	166 27.9	44.4
D 08	233 51.2	250 55.7	48.2	13 15.9	28.7	174 24.8	42.1	181 30.4	44.4
O 09	248 53.6	265 55.8	. . 47.0	28 17.0	. . 29.2	189 27.4	. . 42.1	196 33.0	. . 44.4
M 10	263 56.1	280 56.0	45.8	43 18.0	29.6	204 30.0	42.1	211 35.5	44.4
I 11	278 58.6	295 56.1	44.6	58 19.1	30.0	219 32.5	42.1	226 38.0	44.3
N 12	294 01.0	310 56.2	S 7 43.4	73 20.1	S14 30.5	234 35.1	N19 42.1	241 40.5	N16 44.3
G 13	309 03.5	325 56.4	42.2	88 21.2	30.9	249 37.7	42.0	256 43.0	44.3
O 14	324 05.9	340 56.5	41.0	103 22.3	31.4	264 40.2	42.0	271 45.6	44.3
15	339 08.4	355 56.6	. . 39.8	118 23.3	. . 31.8	279 42.8	. . 42.0	286 48.1	. . 44.3
16	354 10.9	10 56.8	38.6	133 24.4	32.3	294 45.3	42.0	301 50.6	44.3
17	9 13.3	25 56.9	37.4	148 25.4	32.7	309 47.9	42.0	316 53.1	44.3
18	24 15.8	40 57.0	S 7 36.2	163 26.5	S14 33.1	324 50.5	N19 42.0	331 55.6	N16 44.3
19	39 18.3	55 57.2	35.0	178 27.6	33.6	339 53.0	42.0	346 58.1	44.3
20	54 20.7	70 57.3	33.8	193 28.6	34.0	354 55.6	42.0	2 00.6	44.3
21	69 23.2	85 57.5	. . 32.6	208 29.7	. . 34.5	9 58.1	. . 42.0	17 03.2	. . 44.3
22	84 25.7	100 57.6	31.4	223 30.7	34.9	25 00.7	42.0	32 05.7	44.3
23	99 28.1	115 57.7	30.2	238 31.8	35.3	40 03.3	42.0	47 08.2	44.3
15 00	114 30.6	130 57.9	S 7 29.0	253 32.9	S14 35.8	55 05.8	N19 42.0	62 10.7	N16 44.3
01	129 33.1	145 58.0	27.8	268 33.9	36.2	70 08.4	41.9	77 13.2	44.3
02	144 35.5	160 58.2	26.6	283 35.0	36.6	85 10.9	41.9	92 15.7	44.3
03	159 38.0	175 58.3	. . 25.4	298 36.0	. . 37.1	100 13.5	. . 41.9	107 18.2	. . 44.3
04	174 40.4	190 58.5	24.2	313 37.1	37.5	115 16.1	41.9	122 20.8	44.3
05	189 42.9	205 58.6	23.0	328 38.2	38.0	130 18.6	41.9	137 23.3	44.3
06	204 45.4	220 58.8	S 7 21.8	343 39.2	S14 38.4	145 21.2	N19 41.9	152 25.8	N16 44.3
07	219 47.8	235 58.9	20.6	358 40.3	38.8	160 23.7	41.9	167 28.3	44.3
08	234 50.3	250 59.1	19.4	13 41.3	39.3	175 26.3	41.9	182 30.8	44.3
L 09	249 52.8	265 59.2	. . 18.2	28 42.4	. . 39.7	190 28.8	. . 41.9	197 33.3	. . 44.3
U 10	264 55.2	280 59.4	17.0	43 43.5	40.2	205 31.4	41.9	212 35.8	44.3
N 11	279 57.7	295 59.5	15.8	58 44.5	40.6	220 34.0	41.9	227 38.4	44.3
E 12	295 00.2	310 59.7	S 7 14.6	73 45.6	S14 41.0	235 36.5	N19 41.9	242 40.9	N16 44.3
S 13	310 02.6	325 59.8	13.4	88 46.6	41.5	250 39.1	41.9	257 43.4	44.3
14	325 05.1	341 00.0	12.2	103 47.7	41.9	265 41.6	41.9	272 45.9	44.3
15	340 07.6	356 00.2	. . 11.0	118 48.8	. . 42.3	280 44.2	. . 41.8	287 48.4	. . 44.3
16	355 10.0	11 00.3	09.8	133 49.8	42.8	295 46.7	41.8	302 50.9	44.3
17	10 12.5	26 00.5	08.6	148 50.9	43.2	310 49.3	41.8	317 53.4	44.3
18	25 14.9	41 00.6	S 7 07.4	163 51.9	S14 43.6	325 51.8	N19 41.8	332 55.9	N16 44.3
19	40 17.4	56 00.8	06.2	178 53.0	44.1	340 54.4	41.8	347 58.4	44.3
20	55 19.9	71 01.0	05.0	193 54.1	44.5	355 56.9	41.8	3 01.0	44.3
21	70 22.3	86 01.1	. . 03.8	208 55.1	. . 45.0	10 59.5	. . 41.8	18 03.5	. . 44.4
22	85 24.8	101 01.3	02.6	223 56.2	45.4	26 02.0	41.8	33 06.0	44.4
23	100 27.3	116 01.5	01.4	238 57.2	45.8	41 04.6	41.8	48 08.5	44.4
Pas. Mer.	h m 16 23.2	v 0.1	d 1.2	v 1.1	d 0.4	v 2.6	d 0.0	v 2.5	d 0.0

ESTRELLAS		
Nombre	A.H.S.	Dec.
	° ′	° ′
Acamar	315 25.5	S40 18.4
Achernar	335 33.9	S57 14.3
Acrux	173 20.1	S63 05.9
Adhara	255 19.8	S28 58.5
Aldebaran	291 00.3	N16 30.6
Alioth	166 29.1	N55 57.1
Alkaid	153 06.5	N49 18.3
Al Na'ir	27 56.2	S46 57.6
Alnilam	275 55.9	S 1 12.2
Alphard	218 05.3	S 8 39.8
Alphecca	126 19.4	N26 42.6
Alpheratz	357 53.7	N29 05.8
Altair	62 18.1	N 8 52.2
Ankaa	353 25.4	S42 18.4
Antares	112 38.5	S26 25.9
Arcturus	146 04.7	N19 10.6 *
Atria	107 49.6	S69 01.5
Avior	234 21.4	S59 30.7
Bellatrix	278 42.2	N 6 20.9
Betelgeuse	271 11.5	N 7 24.3
Canopus	263 59.9	S52 41.9
Capella	280 48.4	N46 00.0
Deneb	49 38.6	N45 17.0
Denebola	182 43.4	N14 33.9
Diphda	349 05.7	S17 59.1
Dubhe	194 03.1	N61 44.5
Elnath	278 24.6	N28 36.5
Eltanin	90 51.2	N51 29.2
Enif	33 57.0	N 9 52.7
Fomalhaut	15 34.9	S29 37.3
Gacrux	172 11.7	S57 06.8
Gienah	176 02.2	S17 32.7
Hadar	149 01.9	S60 22.3
Hamal	328 11.7	N23 28.0
Kaus Aust.	83 57.1	S34 23.0
Kochab	137 20.0	N74 08.9
Markab	13 48.2	N15 12.6
Menkar	314 25.1	N 4 05.5
Menkent	148 19.2	S36 22.2
Miaplacidus	221 40.9	S69 43.1
Mirfak	308 54.1	N49 52.0
Nunki	76 10.7	S26 17.7
Peacock	53 35.1	S56 44.0
Pollux	243 39.2	N28 01.4
Procyon	245 09.6	N 5 13.3
Rasalhague	96 15.8	N12 33.5
Regulus	207 53.6	N11 57.7
Rigel	281 21.1	S 8 12.2
Rigil Kent.	140 05.4	S60 50.0
Sabik	102 24.0	S15 43.5
Schedar	349 51.8	N56 32.7
Shaula	96 35.5	S37 06.2
Sirius	258 42.0	S16 43.1
Spica	158 41.5	S11 09.9
Suhail	222 59.2	S43 26.1
Vega	80 46.0	N38 47.0
Zuben'ubi	137 16.3	S16 02.6

	A.H.S.	Pas. Mer.
	° ′	h m
Venus	17 23.2	15 16
Marte	139 36.0	7 07
Júpiter	300 32.9	20 20
Saturno	307 38.8	19 52

T.U.	SOL				LUNA					
	A.H.G.		Dec.		A.H.G.	v	Dec.	d	H.P.	
d h	° ′		° ′		° ′	′	° ′	′	′	
13 00	177 51.4		S21 30.1		312 06.5	7.8	N12 44.8	11.9	60.3	
01	192 51.2		29.6		326 33.3	7.9	12 32.9	11.9	60.3	
02	207 50.9		29.2		341 00.2	8.1	12 21.0	12.0	60.3	
03	222 50.7	. .	28.8		355 27.3	8.1	12 09.0	12.1	60.2	
04	237 50.5		28.4		9 54.4	8.2	11 56.9	12.1	60.2	
05	252 50.2		27.9		24 21.6	8.3	11 44.8	12.2	60.2	
06	267 50.0		S21 27.5		38 48.9	8.4	N11 32.6	12.2	60.1	
07	282 49.8		27.1		53 16.3	8.4	11 20.4	12.3	60.1	
S 08	297 49.5		26.7		67 43.7	8.6	11 08.1	12.4	60.1	
A 09	312 49.3	. .	26.2		82 11.3	8.7	10 55.7	12.4	60.0	
10	327 49.1		25.8		96 39.0	8.7	10 43.3	12.4	60.0	
B 11	342 48.9		25.4		111 06.7	8.9	10 30.9	12.5	60.0	
A 12	357 48.6		S21 24.9		125 34.6	8.9	N10 18.4	12.5	59.9	
13	12 48.4		24.5		140 02.5	9.0	10 05.9	12.6	59.9	
D 14	27 48.2		24.1		154 30.5	9.1	9 53.3	12.7	59.9	
15	42 47.9	. .	23.6		168 58.6	9.2	9 40.6	12.6	59.8	
O 16	57 47.7		23.2		183 26.8	9.2	9 28.0	12.7	59.8	
17	72 47.5		22.8		197 55.0	9.4	9 15.3	12.8	59.8	
18	87 47.2		S21 22.3		212 23.4	9.4	N 9 02.5	12.8	59.7	
19	102 47.0		21.9		226 51.8	9.6	8 49.7	12.8	59.7	
20	117 46.8		21.5		241 20.4	9.5	8 36.9	12.8	59.7	
21	132 46.6	. .	21.0		255 48.9	9.7	8 24.1	12.9	59.6	
22	147 46.3		20.6		270 17.6	9.8	8 11.2	12.9	59.6	
23	162 46.1		20.1		284 46.4	9.8	7 58.3	12.9	59.6	
14 00	177 45.9		S21 19.7		299 15.2	9.9	N 7 45.4	13.0	59.5	
01	192 45.6		19.3		313 44.1	10.0	7 32.4	13.0	59.5	
02	207 45.4		18.8		328 13.1	10.1	7 19.4	13.0	59.5	
03	222 45.2	. .	18.4		342 42.2	10.1	7 06.4	13.1	59.4	
04	237 45.0		17.9		357 11.3	10.2	6 53.3	13.0	59.4	
05	252 44.7		17.5		11 40.5	10.3	6 40.3	13.1	59.3	
06	267 44.5		S21 17.1		26 09.8	10.4	N 6 27.2	13.1	59.3	
07	282 44.3		16.6		40 39.2	10.4	6 14.1	13.1	59.3	
08	297 44.1		16.2		55 08.6	10.5	6 01.0	13.2	59.2	
D 09	312 43.8	. .	15.7		69 38.1	10.6	5 47.8	13.1	59.2	
O 10	327 43.6		15.3		84 07.7	10.6	5 34.7	13.2	59.2	
M 11	342 43.4		14.8		98 37.3	10.7	5 21.5	13.1	59.1	
I 12	357 43.2		S21 14.4		113 07.0	10.8	N 5 08.4	13.2	59.1	
N 13	12 42.9		13.9		127 36.8	10.9	4 55.2	13.2	59.0	
G 14	27 42.7		13.5		142 06.7	10.9	4 42.0	13.2	59.0	
O 15	42 42.5	. .	13.0		156 36.6	10.9	4 28.8	13.2	59.0	
16	57 42.3		12.6		171 06.5	11.1	4 15.6	13.2	58.9	
17	72 42.0		12.1		185 36.6	11.0	4 02.4	13.2	58.9	
18	87 41.8		S21 11.7		200 06.6	11.2	N 3 49.2	13.3	58.9	
19	102 41.6		11.2		214 36.8	11.2	3 35.9	13.2	58.8	
20	117 41.4		10.8		229 07.0	11.3	3 22.7	13.2	58.8	
21	132 41.1	. .	10.3		243 37.3	11.3	3 09.5	13.2	58.7	
22	147 40.9		09.9		258 07.6	11.4	2 56.3	13.2	58.7	
23	162 40.7		09.4		272 38.0	11.4	2 43.1	13.2	58.7	
15 00	177 40.5		S21 08.9		287 08.4	11.5	N 2 29.9	13.2	58.6	
01	192 40.3		08.5		301 38.9	11.5	2 16.7	13.2	58.6	
02	207 40.0		08.0		316 09.4	11.6	2 03.5	13.2	58.6	
03	222 39.8	. .	07.6		330 40.0	11.7	1 50.3	13.2	58.5	
04	237 39.6		07.1		345 10.7	11.6	1 37.1	13.2	58.5	
05	252 39.4		06.6		359 41.3	11.8	1 23.9	13.2	58.4	
06	267 39.2		S21 06.2		14 12.1	11.8	N 1 10.7	13.1	58.4	
07	282 38.9		05.7		28 42.9	11.8	0 57.6	13.1	58.4	
08	297 38.7		05.3		43 13.7	11.9	0 44.5	13.2	58.3	
L 09	312 38.5	. .	04.8		57 44.6	11.9	0 31.3	13.1	58.3	
U 10	327 38.3		04.3		72 15.5	12.0	0 18.2	13.1	58.2	
N 11	342 38.1		03.9		86 46.5	12.0	N 0 05.1	13.1	58.2	
E 12	357 37.8		S21 03.4		101 17.5	12.0	S 0 08.0	13.0	58.2	
S 13	12 37.6		02.9		115 48.5	12.1	0 21.0	13.1	58.1	
14	27 37.4		02.5		130 19.6	12.2	0 34.1	13.0	58.1	
15	42 37.2	. .	02.0		144 50.8	12.1	0 47.1	13.0	58.1	
16	57 37.0		01.5		159 21.9	12.2	1 00.1	13.0	58.0	
17	72 36.8		01.1		173 53.1	12.3	1 13.1	12.9	58.0	
18	87 36.5		S21 00.6		188 24.4	12.3	S 1 26.0	12.9	57.9	
19	102 36.3		21 00.1		202 55.7	12.3	1 38.9	13.0	57.9	
20	117 36.1		20 59.7		217 27.0	12.3	1 51.9	12.8	57.9	
21	132 35.9	. .	59.2		231 58.3	12.4	2 04.7	12.9	57.8	
22	147 35.7		58.7		246 29.7	12.4	2 17.6	12.8	57.8	
23	162 35.5		58.2		261 01.1	12.4	S 2 30.4	12.8	57.8	
	SD 16.3		d 0.4		SD	16.3		16.1		15.8

Lat.	Crepúsculo Náutico	Crepúsculo Civil	Orto Sol	Orto Luna 13	Orto Luna 14	Orto Luna 15	Orto Luna 16
°	h m	h m	h m	h m	h m	h m	h m
N 72	08 03	09 55	▬	20 06	22 14	24 14	00 14
N 70	07 48	09 20	▬	20 20	22 18	24 10	00 10
68	07 35	08 55	10 37	20 31	22 21	24 07	00 07
66	07 25	08 36	09 56	20 39	22 24	24 04	00 04
64	07 16	08 20	09 28	20 47	22 26	24 02	00 02
62	07 09	08 07	09 06	20 53	22 28	23 59	25 28
60	07 02	07 56	08 49	20 59	22 30	23 58	25 23
N 58	06 56	07 46	08 35	21 03	22 32	23 56	25 18
56	06 50	07 38	08 22	21 08	22 33	23 55	25 14
54	06 45	07 30	08 11	21 12	22 34	23 53	25 10
52	06 40	07 23	08 02	21 15	22 35	23 52	25 07
50	06 36	07 16	07 53	21 18	22 36	23 51	25 04
45	06 26	07 02	07 35	21 25	22 38	23 49	24 57
N 40	06 17	06 51	07 20	21 31	22 40	23 47	24 52
35	06 09	06 40	07 08	21 35	22 42	23 46	24 47
30	06 02	06 31	06 57	21 40	22 43	23 44	24 43
20	05 47	06 14	06 38	21 47	22 46	23 42	24 36
N 10	05 33	05 59	06 21	21 53	22 48	23 40	24 30
0	05 17	05 43	06 05	21 59	22 50	23 38	24 24
S 10	05 00	05 27	05 50	22 05	22 52	23 36	24 19
20	04 40	05 08	05 33	22 12	22 54	23 34	24 13
30	04 14	04 46	05 13	22 19	22 56	23 31	24 06
35	03 57	04 32	05 01	22 23	22 58	23 30	24 02
40	03 36	04 16	04 48	22 28	22 59	23 29	23 58
45	03 09	03 56	04 32	22 33	23 01	23 27	23 53
S 50	02 32	03 30	04 12	22 40	23 03	23 25	23 47
52	02 11	03 17	04 02	22 43	23 04	23 24	23 44
54	01 43	03 02	03 52	22 46	23 06	23 23	23 41
56	00 57	02 44	03 40	22 50	23 07	23 22	23 38
58	////	02 22	03 26	22 54	23 08	23 21	23 34
S 60	////	01 52	03 09	22 58	23 10	23 20	23 30

Lat.	Ocaso Sol	Crepúsculo Civil	Crepúsculo Náutico	Ocaso Luna 13	Ocaso Luna 14	Ocaso Luna 15	Ocaso Luna 16
°	h m	h m	h m	h m	h m	h m	h m
N 72	▬	14 24	16 16	11 51	11 30	11 12	10 54
N 70	▬	14 59	16 31	11 36	11 23	11 12	11 01
68	13 42	15 24	16 44	11 23	11 17	11 12	11 07
66	14 23	15 43	16 54	11 12	11 13	11 12	11 12
64	14 51	15 58	17 03	11 03	11 08	11 12	11 16
62	15 12	16 12	17 10	10 56	11 05	11 12	11 20
60	15 30	16 23	17 17	10 49	11 02	11 12	11 23
N 58	15 44	16 33	17 23	10 43	10 59	11 13	11 26
56	15 56	16 41	17 29	10 38	10 56	11 13	11 28
54	16 07	16 49	17 34	10 33	10 54	11 13	11 30
52	16 17	16 56	17 38	10 29	10 52	11 13	11 32
50	16 25	17 02	17 43	10 25	10 50	11 13	11 34
45	16 43	17 16	17 53	10 16	10 46	11 13	11 38
N 40	16 58	17 28	18 01	10 09	10 42	11 13	11 42
35	17 11	17 38	18 09	10 03	10 39	11 13	11 45
30	17 22	17 48	18 17	09 58	10 37	11 13	11 48
20	17 41	18 04	18 31	09 48	10 32	11 13	11 52
N 10	17 57	18 20	18 46	09 40	10 28	11 13	11 56
0	18 13	18 35	19 01	09 32	10 24	11 13	12 00
S 10	18 29	18 51	19 18	09 24	10 20	11 13	12 04
20	18 46	19 10	19 38	09 15	10 15	11 13	12 08
30	19 05	19 32	20 04	09 05	10 10	11 13	12 13
35	19 17	19 46	20 21	08 59	10 07	11 13	12 15
40	19 30	20 02	20 41	08 53	10 04	11 12	12 18
45	19 46	20 22	21 08	08 45	10 00	11 12	12 22
S 50	20 06	20 47	21 45	08 36	09 56	11 12	12 26
52	20 15	21 00	22 05	08 31	09 53	11 12	12 28
54	20 25	21 15	22 32	08 27	09 51	11 12	12 30
56	20 37	21 32	23 15	08 21	09 48	11 12	12 33
58	20 51	21 54	////	08 15	09 46	11 12	12 35
S 60	21 08	22 23	////	08 08	09 42	11 12	12 38

Día	SOL E.T. (−) 00h	SOL E.T. (−) 12h	SOL Pas. Mer.	LUNA Pas. Mer. Sup.	LUNA Pas. Mer. Inf.	LUNA Edad	LUNA Fase
d	m s	m s	h m	h m	h m	d	%
13	08 34	08 45	12 09	03 19	15 46	19	81
14	08 56	09 07	12 09	04 12	16 37	20	72
15	09 18	09 28	12 09	05 01	17 25	21	61

T.U.	ARIES	VENUS −4.4		MARTE +1.2		Júpiter −2.6		SATURNO +0.0	
	A.H.G.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
16 00	115 29.7	131 01.6	S 7 00.2	253 58.3	S14 46.3	56 07.1	N19 41.8	63 11.0	N16 44.4
01	130 32.2	146 01.8	6 59.0	268 59.3	46.7	71 09.7	41.8	78 13.5	44.4
02	145 34.7	161 02.0	57.8	284 00.4	47.1	86 12.2	41.8	93 16.0	44.4
03	160 37.1	176 02.1	56.6	299 01.5	47.6	101 14.8	41.8	108 18.5	44.4
04	175 39.6	191 02.3	55.4	314 02.5	48.0	116 17.3	41.8	123 21.0	44.4
05	190 42.0	206 02.5	54.2	329 03.6	48.4	131 19.9	41.8	138 23.5	44.4
06	205 44.5	221 02.6	S 6 53.0	344 04.6	S14 48.9	146 22.4	N19 41.8	153 26.1	N16 44.4
07	220 47.0	236 02.8	51.8	359 05.7	49.3	161 25.0	41.7	168 28.6	44.4
08	235 49.4	251 03.0	50.6	14 06.8	49.7	176 27.5	41.7	183 31.1	44.4
M 09	250 51.9	266 03.2	49.4	29 07.8	50.2	191 30.1	41.7	198 33.6	44.4
A 10	265 54.4	281 03.3	48.2	44 08.9	50.6	206 32.6	41.7	213 36.1	44.4
R 11	280 56.8	296 03.5	47.0	59 09.9	51.0	221 35.2	41.7	228 38.6	44.4
T 12	295 59.3	311 03.7	S 6 45.8	74 11.0	S14 51.5	236 37.7	N19 41.7	243 41.1	N16 44.4
13	311 01.8	326 03.9	44.6	89 12.1	51.9	251 40.3	41.7	258 43.6	44.4
E 14	326 04.2	341 04.0	43.4	104 13.1	52.3	266 42.8	41.7	273 46.1	44.4
S 15	341 06.7	356 04.2	42.2	119 14.2	52.8	281 45.3	41.7	288 48.6	44.4
16	356 09.2	11 04.4	40.9	134 15.3	53.2	296 47.9	41.7	303 51.1	44.4
17	11 11.6	26 04.6	39.7	149 16.3	53.6	311 50.4	41.7	318 53.6	44.4
18	26 14.1	41 04.8	S 6 38.5	164 17.4	S14 54.1	326 53.0	N19 41.7	333 56.1	N16 44.4
19	41 16.5	56 04.9	37.3	179 18.4	54.5	341 55.5	41.7	348 58.7	44.4
20	56 19.0	71 05.1	36.1	194 19.5	54.9	356 58.1	41.7	4 01.2	44.4
21	71 21.5	86 05.3	34.9	209 20.6	55.4	12 00.6	41.7	19 03.7	44.4
22	86 23.9	101 05.5	33.7	224 21.6	55.8	27 03.1	41.7	34 06.2	44.4
23	101 26.4	116 05.7	32.5	239 22.7	56.2	42 05.7	41.7	49 08.7	44.4
17 00	116 28.9	131 05.9	S 6 31.3	254 23.7	S14 56.6	57 08.2	N19 41.7	64 11.2	N16 44.4
01	131 31.3	146 06.1	30.1	269 24.8	57.1	72 10.8	41.7	79 13.7	44.4
02	146 33.8	161 06.3	28.9	284 25.9	57.5	87 13.3	41.7	94 16.2	44.4
03	161 36.3	176 06.4	27.7	299 26.9	57.9	102 15.9	41.7	109 18.7	44.4
04	176 38.7	191 06.6	26.5	314 28.0	58.4	117 18.4	41.6	124 21.2	44.4
05	191 41.2	206 06.8	25.3	329 29.0	58.8	132 20.9	41.6	139 23.7	44.4
06	206 43.6	221 07.0	S 6 24.1	344 30.1	S14 59.2	147 23.5	N19 41.6	154 26.2	N16 44.4
M 07	221 46.1	236 07.2	22.9	359 31.2	14 59.7	162 26.0	41.6	169 28.7	44.4
I 08	236 48.6	251 07.4	21.7	14 32.2	15 00.1	177 28.5	41.6	184 31.2	44.4
E 09	251 51.0	266 07.6	20.5	29 33.3	00.5	192 31.1	41.6	199 33.7	44.4
R 10	266 53.5	281 07.8	19.2	44 34.3	00.9	207 33.6	41.6	214 36.2	44.4
C 11	281 56.0	296 08.0	18.0	59 35.4	01.4	222 36.2	41.6	229 38.7	44.4
O 12	296 58.4	311 08.2	S 6 16.8	74 36.5	S15 01.8	237 38.7	N19 41.6	244 41.2	N16 44.4
L 13	312 00.9	326 08.4	15.6	89 37.5	02.2	252 41.2	41.6	259 43.7	44.4
E 14	327 03.4	341 08.6	14.4	104 38.6	02.7	267 43.8	41.6	274 46.2	44.4
S 15	342 05.8	356 08.8	13.2	119 39.6	03.1	282 46.3	41.6	289 48.7	44.4
16	357 08.3	11 09.0	12.0	134 40.7	03.5	297 48.8	41.6	304 51.2	44.4
17	12 10.8	26 09.2	10.8	149 41.8	03.9	312 51.4	41.6	319 53.7	44.4
18	27 13.2	41 09.4	S 6 09.6	164 42.8	S15 04.4	327 53.9	N19 41.6	334 56.2	N16 44.4
19	42 15.7	56 09.6	08.4	179 43.9	04.8	342 56.4	41.6	349 58.8	44.4
20	57 18.1	71 09.8	07.2	194 44.9	05.2	357 59.0	41.6	5 01.3	44.4
21	72 20.6	86 10.0	06.0	209 46.0	05.6	13 01.5	41.6	20 03.8	44.4
22	87 23.1	101 10.2	04.8	224 47.1	06.1	28 04.0	41.6	35 06.3	44.4
23	102 25.5	116 10.5	03.5	239 48.1	06.5	43 06.6	41.6	50 08.8	44.5
18 00	117 28.0	131 10.7	S 6 02.3	254 49.2	S15 06.9	58 09.1	N19 41.6	65 11.3	N16 44.5
01	132 30.5	146 10.9	6 01.1	269 50.3	07.4	73 11.6	41.6	80 13.8	44.5
02	147 32.9	161 11.1	5 59.9	284 51.3	07.8	88 14.2	41.6	95 16.3	44.5
03	162 35.4	176 11.3	58.7	299 52.4	08.2	103 16.7	41.6	110 18.8	44.5
04	177 37.9	191 11.5	57.5	314 53.4	08.6	118 19.2	41.6	125 21.3	44.5
05	192 40.3	206 11.7	56.3	329 54.5	09.1	133 21.8	41.6	140 23.8	44.5
06	207 42.8	221 11.9	S 5 55.1	344 55.6	S15 09.5	148 24.3	N19 41.6	155 26.3	N16 44.5
07	222 45.3	236 12.2	53.9	359 56.6	09.9	163 26.8	41.6	170 28.8	44.5
J 08	237 47.7	251 12.4	52.7	14 57.7	10.3	178 29.4	41.6	185 31.3	44.5
U 09	252 50.2	266 12.6	51.5	29 58.7	10.8	193 31.9	41.6	200 33.8	44.5
E 10	267 52.6	281 12.8	50.3	44 59.8	11.2	208 34.4	41.6	215 36.3	44.5
V 11	282 55.1	296 13.0	49.0	60 00.9	11.6	223 36.9	41.6	230 38.8	44.5
E 12	297 57.6	311 13.3	S 5 47.8	75 01.9	S15 12.0	238 39.5	N19 41.6	245 41.2	N16 44.5
13	313 00.0	326 13.5	46.6	90 03.0	12.5	253 42.0	41.6	260 43.7	44.5
S 14	328 02.5	341 13.7	45.4	105 04.0	12.9	268 44.5	41.6	275 46.2	44.5
15	343 05.0	356 13.9	44.2	120 05.1	13.3	283 47.1	41.5	290 48.7	44.5
16	358 07.4	11 14.2	43.0	135 06.2	13.7	298 49.6	41.5	305 51.2	44.5
17	13 09.9	26 14.4	41.8	150 07.2	14.1	313 52.1	41.5	320 53.7	44.5
18	28 12.4	41 14.6	S 5 40.6	165 08.3	S15 14.6	328 54.6	N19 41.5	335 56.2	N16 44.5
19	43 14.8	56 14.8	39.4	180 09.4	15.0	343 57.2	41.5	350 58.7	44.5
20	58 17.3	71 15.1	38.2	195 10.4	15.4	358 59.7	41.5	6 01.2	44.5
21	73 19.8	86 15.3	37.0	210 11.5	15.8	14 02.2	41.5	21 03.7	44.5
22	88 22.2	101 15.5	35.7	225 12.5	16.3	29 04.7	41.5	36 06.2	44.5
23	103 24.7	116 15.8	34.5	240 13.6	16.7	44 07.3	41.5	51 08.7	44.5
Pas. Mer.	h m 16 11.4	v 0.2	d 1.2	v 1.1	d 0.4	v 2.5	d 0.0	v 2.5	d 0.0

ESTRELLAS		
Nombre	A.H.S.	Dec.
	° ′	° ′
Acamar	315 25.5	S40 18.4
Achernar	335 33.9	S57 14.3
Acrux	173 20.0	S63 05.9
Adhara	255 19.8	S28 58.5
Aldebaran	291 00.3	N16 30.6
Alioth	166 29.0	N55 57.1
Alkaid	153 06.5	N49 18.3
Al Na'ir	27 56.3	S46 57.6
Alnilam	275 55.9	S 1 12.2
Alphard	218 05.3	S 8 39.8
Alphecca	126 19.4	N26 42.6
Alpheratz	357 53.7	N29 05.8
Altair	62 18.1	N 8 52.2
Ankaa	353 25.4	S42 18.4
Antares	112 38.5	S26 25.9
Arcturus	146 04.7	N19 10.6
Atria	107 49.5	S69 01.5
Avior	234 21.4	S59 30.7
Bellatrix	278 42.2	N 6 20.9
Betelgeuse	271 11.5	N 7 24.3
Canopus	263 59.9	S52 41.9
Capella	280 48.4	N46 00.0
Deneb	49 38.6	N45 17.0
Denebola	182 43.4	N14 33.9
Diphda	349 05.7	S17 59.1
Dubhe	194 03.0	N61 44.5
Elnath	278 24.6	N28 36.5
Eltanin	90 51.1	N51 29.2
Enif	33 57.0	N 9 52.7
Fomalhaut	15 34.9	S29 37.3
Gacrux	172 11.6	S57 06.8
Gienah	176 02.2	S17 32.7
Hadar	149 01.9	S60 22.3
Hamal	328 11.7	N23 28.0
Kaus Aust.	83 57.1	S34 23.0
Kochab	137 19.9	N74 08.8
Markab	13 48.2	N15 12.6
Menkar	314 25.1	N 4 05.5
Menkent	148 19.1	S36 22.2
Miaplacidus	221 40.9	S69 43.1
Mirfak	308 54.1	N49 52.0
Nunki	76 10.7	S26 17.7
Peacock	53 35.1	S56 44.0
Pollux	243 39.2	N28 01.4
Procyon	245 09.6	N 5 13.3
Rasalhague	96 15.8	N12 33.5
Regulus	207 53.6	N11 57.7
Rigel	281 21.1	S 8 12.2
Rigil Kent.	140 05.3	S60 50.0
Sabik	102 24.0	S15 43.5
Schedar	349 51.9	N56 32.7
Shaula	96 35.5	S37 06.2
Sirius	258 42.0	S16 43.1
Spica	158 41.5	S11 09.9
Suhail	222 59.2	S43 26.1
Vega	80 46.0	N38 47.0
Zuben'ubi	137 16.3	S16 02.6

	A.H.S.	Pas. Mer.
	° ′	h m
Venus	14 37.0	15 15
Marte	137 54.9	7 02
Júpiter	300 39.4	20 08
Saturno	307 42.3	19 40

T.U.	SOL				LUNA						
	A.H.G.		Dec.		A.H.G.	v		Dec.	d	P.H.	
d h	°	′	°	′	°	′	′	°	′	′	′
16 00	177	35.3	S20	57.8	275	32.5	12.5	S 2	43.2	12.8	57.7
01	192	35.0		57.3	290	04.0	12.5	2	56.0	12.7	57.7
02	207	34.8		56.8	304	35.5	12.5	3	08.7	12.7	57.7
03	222	34.6	. .	56.3	319	07.0	12.6	3	21.4	12.7	57.6
04	237	34.4		55.9	333	38.6	12.5	3	34.1	12.6	57.6
05	252	34.2		55.4	348	10.1	12.6	3	46.7	12.6	57.5
06	267	34.0	S20	54.9	2	41.7	12.7	S 3	59.3	12.6	57.5
07	282	33.8		54.4	17	13.4	12.6	4	11.9	12.5	57.5
08	297	33.5		54.0	31	45.0	12.7	4	24.4	12.5	57.4
09	312	33.3	. .	53.5	46	16.7	12.7	4	36.9	12.5	57.4
10	327	33.1		53.0	60	48.4	12.7	4	49.4	12.4	57.4
11	342	32.9		52.5	75	20.1	12.7	5	01.8	12.4	57.3
12	357	32.7	S20	52.0	89	51.8	12.7	S 5	14.2	12.3	57.3
13	12	32.5		51.5	104	23.5	12.8	5	26.5	12.3	57.3
14	27	32.3		51.1	118	55.3	12.8	5	38.8	12.3	57.2
15	42	32.1	. .	50.6	133	27.1	12.8	5	51.1	12.2	57.2
16	57	31.9		50.1	147	58.9	12.8	6	03.3	12.2	57.1
17	72	31.6		49.6	162	30.7	12.8	6	15.5	12.1	57.1
18	87	31.4	S20	49.1	177	02.5	12.8	S 6	27.6	12.1	57.1
19	102	31.2		48.6	191	34.3	12.9	6	39.7	12.0	57.0
20	117	31.0		48.1	206	06.2	12.8	6	51.7	12.0	57.0
21	132	30.8	. .	47.7	220	38.0	12.9	7	03.7	11.9	57.0
22	147	30.6		47.2	235	09.9	12.8	7	15.6	11.9	56.9
23	162	30.4		46.7	249	41.7	12.9	7	27.5	11.9	56.9
17 00	177	30.2	S20	46.2	264	13.6	12.9	S 7	39.4	11.8	56.9
01	192	30.0		45.7	278	45.5	12.9	7	51.2	11.7	56.8
02	207	29.8		45.2	293	17.4	12.9	8	02.9	11.7	56.8
03	222	29.6	. .	44.7	307	49.3	12.9	8	14.6	11.6	56.8
04	237	29.4		44.2	322	21.2	12.9	8	26.2	11.6	56.7
05	252	29.2		43.7	336	53.1	12.9	8	37.8	11.6	56.7
06	267	29.0	S20	43.2	351	25.0	12.9	S 8	49.4	11.4	56.7
07	282	28.7		42.7	5	56.9	12.9	9	00.8	11.5	56.6
08	297	28.5		42.2	20	28.8	13.0	9	12.3	11.3	56.6
09	312	28.3	. .	41.7	35	00.8	12.9	9	23.6	11.4	56.6
10	327	28.1		41.3	49	32.7	12.9	9	35.0	11.2	56.5
11	342	27.9		40.8	64	04.6	12.9	9	46.2	11.2	56.5
12	357	27.7	S20	40.3	78	36.5	12.9	S 9	57.4	11.2	56.5
13	12	27.5		39.8	93	08.4	12.9	10	08.6	11.0	56.5
14	27	27.3		39.3	107	40.3	12.9	10	19.6	11.1	56.4
15	42	27.1	. .	38.8	122	12.2	12.9	10	30.7	10.9	56.4
16	57	26.9		38.3	136	44.1	12.9	10	41.6	10.9	56.4
17	72	26.7		37.8	151	16.0	12.9	10	52.5	10.9	56.3
18	87	26.5	S20	37.3	165	47.9	12.9	S11	03.4	10.7	56.3
19	102	26.3		36.7	180	19.8	12.9	11	14.1	10.8	56.3
20	117	26.1		36.2	194	51.7	12.9	11	24.9	10.6	56.2
21	132	25.9	. .	35.7	209	23.6	12.8	11	35.5	10.6	56.2
22	147	25.7		35.2	223	55.4	12.9	11	46.1	10.5	56.2
23	162	25.5		34.7	238	27.3	12.8	11	56.6	10.5	56.2
18 00	177	25.3	S20	34.2	252	59.1	12.9	S12	07.1	10.4	56.1
01	192	25.1		33.7	267	31.0	12.8	12	17.5	10.3	56.1
02	207	24.9		33.2	282	02.8	12.8	12	27.8	10.2	56.1
03	222	24.7	. .	32.7	296	34.6	12.8	12	38.0	10.2	56.0
04	237	24.5		32.2	311	06.4	12.8	12	48.2	10.1	56.0
05	252	24.3		31.7	325	38.2	12.8	12	58.3	10.1	56.0
06	267	24.1	S20	31.2	340	10.0	12.8	S13	08.4	10.0	56.0
07	282	23.9		30.7	354	41.8	12.7	13	18.4	9.9	55.9
08	297	23.7		30.1	9	13.5	12.8	13	28.3	9.8	55.9
09	312	23.5	. .	29.6	23	45.3	12.7	13	38.1	9.8	55.9
10	327	23.3		29.1	38	17.0	12.7	13	47.9	9.7	55.8
11	342	23.1		28.6	52	48.7	12.7	13	57.6	9.6	55.8
12	357	22.9	S20	28.1	67	20.4	12.7	S14	07.2	9.5	55.8
13	12	22.7		27.6	81	52.1	12.6	14	16.7	9.5	55.8
14	27	22.5		27.1	96	23.7	12.7	14	26.2	9.4	55.7
15	42	22.3	. .	26.5	110	55.4	12.6	14	35.6	9.3	55.7
16	57	22.1		26.0	125	27.0	12.6	14	44.9	9.3	55.7
17	72	21.9		25.5	139	58.6	12.6	14	54.2	9.1	55.7
18	87	21.7	S20	25.0	154	30.2	12.6	S15	03.3	9.1	55.6
19	102	21.5		24.5	169	01.8	12.6	15	12.4	9.0	55.6
20	117	21.4		23.9	183	33.4	12.5	15	21.4	9.0	55.6
21	132	21.2	. .	23.4	198	04.9	12.5	15	30.4	8.8	55.6
22	147	21.0		22.9	212	36.4	12.5	15	39.2	8.8	55.5
23	162	20.8		22.4	227	07.9	12.5	S15	48.0	8.7	55.5
	SD	16.3	d	0.5	SD		15.6		15.4		15.2

Lat.	Crepúsculo Náutico	Crepúsculo Civil	Orto Sol	Orto Luna 16	Orto Luna 17	Orto Luna 18	Orto Luna 19
°	h m	h m	h m	h m	h m	h m	h m
N 72	07 56	09 43	▬	00 14	02 13	04 17	06 47
N 70	07 42	09 11	11 40	00 10	02 00	03 51	05 50
68	07 30	08 48	10 23	00 07	01 50	03 32	05 17
66	07 21	08 30	09 47	00 04	01 41	03 17	04 53
64	07 12	08 15	09 21	00 02	01 34	03 05	04 34
62	07 05	08 03	09 01	25 28	01 28	02 54	04 19
60	06 59	07 52	08 44	25 23	01 23	02 45	04 06
N 58	06 53	07 43	08 31	25 18	01 18	02 38	03 55
56	06 48	07 35	08 19	25 14	01 14	02 31	03 45
54	06 43	07 27	08 08	25 10	01 10	02 25	03 37
52	06 38	07 20	07 59	25 07	01 07	02 19	03 30
50	06 34	07 14	07 51	25 04	01 04	02 14	03 23
45	06 25	07 01	07 34	24 57	00 57	02 04	03 08
N 40	06 16	06 50	07 19	24 52	00 52	01 55	02 57
35	06 09	06 40	07 07	24 47	00 47	01 47	02 47
30	06 01	06 31	06 56	24 43	00 43	01 41	02 38
20	05 47	06 14	06 38	24 36	00 36	01 30	02 23
N 10	05 33	05 59	06 22	24 30	00 30	01 20	02 10
0	05 19	05 44	06 07	24 24	00 24	01 11	01 58
S 10	05 02	05 29	05 51	24 19	00 19	01 02	01 45
20	04 42	05 11	05 35	24 13	00 13	00 52	01 33
30	04 17	04 49	05 15	24 06	00 06	00 41	01 18
35	04 00	04 35	05 04	24 02	00 02	00 35	01 09
40	03 40	04 20	04 51	23 58	24 28	00 28	01 00
45	03 15	04 00	04 36	23 53	24 20	00 20	00 49
S 50	02 39	03 35	04 17	23 47	24 10	00 10	00 35
52	02 19	03 23	04 07	23 44	24 05	00 05	00 29
54	01 53	03 09	03 57	23 41	24 00	00 00	00 22
56	01 15	02 52	03 46	23 38	23 55	24 14	00 14
58	////	02 31	03 32	23 34	23 48	24 06	00 06
S 60	////	02 03	03 16	23 30	23 42	23 56	24 14

Lat.	Ocaso Sol	Crepúsculo Civil	Crepúsculo Náutico	Ocaso Luna 16	Ocaso Luna 17	Ocaso Luna 18	Ocaso Luna 19
°	h m	h m	h m	h m	h m	h m	h m
N 72	▬	14 38	16 26	10 54	10 34	10 08	09 16
N 70	12 41	15 10	16 40	11 01	10 49	10 35	10 14
68	13 58	15 33	16 51	11 07	11 01	10 55	10 48
66	14 34	15 51	17 01	11 12	11 11	11 12	11 13
64	15 00	16 06	17 09	11 16	11 20	11 25	11 33
62	15 20	16 18	17 16	11 20	11 27	11 36	11 49
60	15 37	16 29	17 22	11 23	11 34	11 46	12 02
N 58	15 50	16 38	17 28	11 26	11 39	11 55	12 14
56	16 02	16 46	17 33	11 28	11 44	12 02	12 24
54	16 12	16 54	17 38	11 30	11 49	12 09	12 33
52	16 21	17 00	17 42	11 32	11 53	12 15	12 41
50	16 30	17 06	17 47	11 34	11 56	12 20	12 48
45	16 47	17 20	17 56	11 38	12 05	12 32	13 03
N 40	17 01	17 31	18 04	11 42	12 11	12 42	13 16
35	17 14	17 41	18 12	11 45	12 17	12 51	13 27
30	17 24	17 50	18 19	11 48	12 22	12 58	13 36
20	17 43	18 06	18 33	11 52	12 31	13 11	13 53
N 10	17 59	18 21	18 47	11 56	12 39	13 22	14 07
0	18 14	18 36	19 02	12 00	12 47	13 33	14 20
S 10	18 29	18 52	19 18	12 04	12 54	13 44	14 34
20	18 46	19 10	19 38	12 08	13 02	13 55	14 48
30	19 05	19 31	20 03	12 13	13 11	14 08	15 05
35	19 16	19 44	20 19	12 15	13 16	14 16	15 15
40	19 29	20 00	20 39	12 18	13 22	14 25	15 26
45	19 44	20 19	21 05	12 22	13 29	14 35	15 39
S 50	20 03	20 44	21 40	12 26	13 38	14 47	15 55
52	20 12	20 56	21 59	12 28	13 42	14 53	16 02
54	20 22	21 10	22 24	12 30	13 46	14 59	16 10
56	20 33	21 27	23 00	12 33	13 51	15 07	16 20
58	20 47	21 47	////	12 35	13 56	15 15	16 30
S 60	21 02	22 14	////	12 38	14 02	15 24	16 43

Día	SOL E.T. (−) 00h	SOL E.T. (−) 12h	SOL Pas. Mer.	LUNA Pas. Mer. Sup.	LUNA Pas. Mer. Inf.	LUNA Edad	LUNA Fase
d	m s	m s	h m	h m	h m	d	%
16	**09 39**	**09 49**	12 10	05 49	18 12	22	50
17	**09 59**	**10 09**	12 10	06 35	18 59	23	40
18	**10 18**	**10 28**	12 10	07 22	19 45	24	30

T.U.	ARIES	VENUS −4.4		MARTE +1.1		JUPITER −2.6		SATURNO +0.0		ESTRELLAS		
d h	A.H.G. ° ′	A.H.G. ° ′	Dec. ° ′	A.H.G. ° ′	Dec. ° ′	A.H.G. ° ′	Dec. ° ′	A.H.G. ° ′	Dec. ° ′	Nombre	A.H.S. ° ′	Dec. ° ′
19 00	118 27.1	131 16.0	S 5 33.3	255 14.7	S15 17.1	59 09.8	N19 41.5	66 11.2	N16 44.5	Acamar	315 25.6	S40 18.4
01	133 29.6	146 16.2	32.1	270 15.7	17.5	74 12.3	41.5	81 13.7	44.6	Achernar	335 34.0	S57 14.3
02	148 32.1	161 16.5	30.9	285 16.8	18.0	89 14.8	41.5	96 16.2	44.6	Acrux	173 20.0	S63 05.9
03	163 34.5	176 16.7	. . 29.7	300 17.8	. . 18.4	104 17.4	. . 41.5	111 18.7	. . 44.6	Adhara	255 19.8	S28 58.5
04	178 37.0	191 16.9	28.5	315 18.9	18.8	119 19.9	41.5	126 21.2	44.6	Aldebaran	291 00.3	N16 30.6
05	193 39.5	206 17.2	27.3	330 20.0	19.2	134 22.4	41.5	141 23.7	44.6			
06	208 41.9	221 17.4	S 5 26.1	345 21.0	S15 19.6	149 24.9	N19 41.5	156 26.2	N16 44.6	Alioth	166 29.0	N55 57.0
07	223 44.4	236 17.6	24.9	0 22.1	20.1	164 27.4	41.5	171 28.7	44.6	Alkaid	153 06.5	N49 18.3
08	238 46.9	251 17.9	23.6	15 23.2	20.5	179 30.0	41.5	186 31.2	44.6	Al Na'ir	27 56.3	S46 57.6
V 09	253 49.3	266 18.1	. . 22.4	30 24.2	. . 20.9	194 32.5	. . 41.5	201 33.7	. . 44.6	Alnilam	275 55.9	S 1 12.2
I 10	268 51.8	281 18.4	21.2	45 25.3	21.3	209 35.0	41.5	216 36.2	44.6	Alphard	218 05.3	S 8 39.8
E 11	283 54.2	296 18.6	20.0	60 26.3	21.7	224 37.5	41.5	231 38.7	44.6			
R 12	298 56.7	311 18.9	S 5 18.8	75 27.4	S15 22.2	239 40.0	N19 41.5	246 41.2	N16 44.6	Alphecca	126 19.4	N26 42.6
N 13	313 59.2	326 19.1	17.6	90 28.5	22.6	254 42.6	41.5	261 43.6	44.6	Alpheratz	357 53.8	N29 05.8
E 14	329 01.6	341 19.3	16.4	105 29.5	23.0	269 45.1	41.5	276 46.1	44.6	Altair	62 18.0	N 8 52.2
S 15	344 04.1	356 19.6	. . 15.2	120 30.6	. . 23.4	284 47.6	. . 41.5	291 48.6	. . 44.6	Ankaa	353 25.4	S42 18.4
16	359 06.6	11 19.8	14.0	135 31.7	23.8	299 50.1	41.5	306 51.1	44.6	Antares	112 38.4	S26 25.9
17	14 09.0	26 20.1	12.7	150 32.7	24.3	314 52.6	41.5	321 53.6	44.6			
18	29 11.5	41 20.3	S 5 11.5	165 33.8	S15 24.7	329 55.1	N19 41.5	336 56.1	N16 44.6	Arcturus	146 04.6	N19 10.6
19	44 14.0	56 20.6	10.3	180 34.8	25.1	344 57.7	41.5	351 58.6	44.6	Atria	107 49.5	S69 01.5
20	59 16.4	71 20.8	09.1	195 35.9	25.5	0 00.2	41.5	7 01.1	44.6	Avior	234 21.4	S59 30.8
21	74 18.9	86 21.1	. . 07.9	210 37.0	. . 25.9	15 02.7	. . 41.5	22 03.6	. . 44.7	Bellatrix	278 42.2	N 6 20.9
22	89 21.4	101 21.3	06.7	225 38.0	26.3	30 05.2	41.5	37 06.1	44.7	Betelgeuse	271 11.5	N 7 24.3
23	104 23.8	116 21.6	05.5	240 39.1	26.8	45 07.7	41.5	52 08.6	44.7			
20 00	119 26.3	131 21.9	S 5 04.3	255 40.2	S15 27.2	60 10.2	N19 41.5	67 11.1	N16 44.7	Canopus	263 59.9	S52 42.0
01	134 28.7	146 22.1	03.1	270 41.2	27.6	75 12.8	41.5	82 13.5	44.7	Capella	280 48.4	N46 00.0
02	149 31.2	161 22.4	01.8	285 42.3	28.0	90 15.3	41.5	97 16.0	44.7	Deneb	49 38.6	N45 17.0
03	164 33.7	176 22.6	5 00.6	300 43.3	. . 28.4	105 17.8	. . 41.5	112 18.5	. . 44.7	Deneboia	182 43.4	N14 33.9
04	179 36.1	191 22.9	4 59.4	315 44.4	28.9	120 20.3	41.5	127 21.0	44.7	Diphda	349 05.7	S17 59.1
05	194 38.6	206 23.1	58.2	330 45.5	29.3	135 22.8	41.5	142 23.5	44.7			
06	209 41.1	221 23.4	S 4 57.0	345 46.5	S15 29.7	150 25.3	N19 41.5	157 26.0	N16 44.7	Dubhe	194 03.0	N61 44.5
07	224 43.5	236 23.7	55.8	0 47.6	30.1	165 27.8	41.5	172 28.5	44.7	Elnath	278 24.6	N28 36.5
S 08	239 46.0	251 23.9	54.6	15 48.7	30.5	180 30.3	41.5	187 31.0	44.7	Eltanin	90 51.1	N51 29.2
A 09	254 48.5	266 24.2	. . 53.4	30 49.7	. . 30.9	195 32.9	. . 41.5	202 33.5	. . 44.7	Enif	33 57.0	N 9 52.7
B 10	269 50.9	281 24.5	52.2	45 50.8	31.4	210 35.4	41.5	217 36.0	44.7	Fomalhaut	15 34.9	S29 37.3
A 11	284 53.4	296 24.7	50.9	60 51.8	31.8	225 37.9	41.6	232 38.4	44.7			
D 12	299 55.9	311 25.0	S 4 49.7	75 52.9	S15 32.2	240 40.4	N19 41.6	247 40.9	N16 44.7	Gacrux	172 11.6	S57 06.8
O 13	314 58.3	326 25.3	48.5	90 54.0	32.6	255 42.9	41.6	262 43.4	44.7	Gienah	176 02.2	S17 32.7
14	330 00.8	341 25.5	47.3	105 55.0	33.0	270 45.4	41.6	277 45.9	44.8	Hadar	149 01.8	S60 22.3
15	345 03.2	356 25.8	. . 46.1	120 56.1	. . 33.4	285 47.9	. . 41.6	292 48.4	. . 44.8	Hamal	328 11.7	N23 28.0
16	0 05.7	11 26.1	44.9	135 57.2	33.8	300 50.4	41.6	307 50.9	44.8	Kaus Aust.	83 57.1	S34 23.0
17	15 08.2	26 26.3	43.7	150 58.2	34.3	315 52.9	41.6	322 53.4	44.8			
18	30 10.6	41 26.6	S 4 42.5	165 59.3	S15 34.7	330 55.4	N19 41.6	337 55.9	N16 44.8	Kochab	137 19.9	N74 08.8
19	45 13.1	56 26.9	41.2	181 00.4	35.1	345 57.9	41.6	352 58.4	44.8	Markab	13 48.3	N15 12.6
20	60 15.6	71 27.2	40.0	196 01.4	35.5	1 00.5	41.6	8 00.8	44.8	Menkar	314 25.1	N 4 05.5
21	75 18.0	86 27.4	. . 38.8	211 02.5	. . 35.9	16 03.0	. . 41.6	23 03.3	. . 44.8	Menkent	148 19.1	S36 22.3
22	90 20.5	101 27.7	37.6	226 03.5	36.3	31 05.5	41.6	38 05.8	44.8	Miaplacidus	221 40.9	S69 43.2
23	105 23.0	116 28.0	36.4	241 04.6	36.7	46 08.0	41.6	53 08.3	44.8			
21 00	120 25.4	131 28.3	S 4 35.2	256 05.7	S15 37.2	61 10.5	N19 41.6	68 10.8	N16 44.8	Mirfak	308 54.1	N49 52.0
01	135 27.9	146 28.5	34.0	271 06.7	37.6	76 13.0	41.6	83 13.3	44.8	Nunki	76 10.7	S26 17.7
02	150 30.4	161 28.8	32.8	286 07.8	38.0	91 15.5	41.6	98 15.8	44.8	Peacock	53 35.1	S56 44.0
03	165 32.8	176 29.1	. . 31.5	301 08.9	. . 38.4	106 18.0	. . 41.6	113 18.2	. . 44.8	Pollux	243 39.2	N28 01.4
04	180 35.3	191 29.4	30.3	316 09.9	38.8	121 20.5	41.6	128 20.7	44.8	Procyon	245 09.6	N 5 13.3
05	195 37.7	206 29.7	29.1	331 11.0	39.2	136 23.0	41.6	143 23.2	44.9			
06	210 40.2	221 29.9	S 4 27.9	346 12.0	S15 39.6	151 25.5	N19 41.6	158 25.7	N16 44.9	Rasalhague	96 15.8	N12 33.5
07	225 42.7	236 30.2	26.7	1 13.1	40.0	166 28.0	41.6	173 28.2	44.9	Regulus	207 53.5	N11 57.7
08	240 45.1	251 30.5	25.5	16 14.2	40.5	181 30.5	41.6	188 30.7	44.9	Rigel	281 21.1	S 8 12.2
D 09	255 47.6	266 30.8	. . 24.3	31 15.2	. . 40.9	196 33.0	. . 41.6	203 33.2	. . 44.9	Rigil Kent.	140 05.3	S60 50.0
O 10	270 50.1	281 31.1	23.1	46 16.3	41.3	211 35.5	41.6	218 35.6	44.9	Sabik	102 24.0	S15 43.5
M 11	285 52.5	296 31.4	21.9	61 17.4	41.7	226 38.0	41.6	233 38.1	44.9			
I 12	300 55.0	311 31.7	S 4 20.6	76 18.4	S15 42.1	241 40.5	N19 41.6	248 40.6	N16 44.9	Schedar	349 51.9	N56 32.7
N 13	315 57.5	326 32.0	19.4	91 19.5	42.5	256 43.0	41.6	263 43.1	44.9	Shaula	96 35.5	S37 06.2
G 14	330 59.9	341 32.3	18.2	106 20.6	42.9	271 45.5	41.6	278 45.6	44.9	Sirius	258 42.0	S16 43.2
O 15	346 02.4	356 32.5	. . 17.0	121 21.6	. . 43.3	286 48.0	. . 41.6	293 48.1	. . 44.9	Spica	158 41.5	S11 09.9
16	1 04.8	11 32.8	15.8	136 22.7	43.7	301 50.5	41.6	308 50.5	44.9	Suhail	222 59.2	S43 26.1
17	16 07.3	26 33.1	14.6	151 23.8	44.2	316 53.0	41.6	323 53.0	44.9			
18	31 09.8	41 33.4	S 4 13.4	166 24.8	S15 44.6	331 55.5	N19 41.6	338 55.5	N16 45.0	Vega	80 45.9	N38 47.0
19	46 12.2	56 33.7	12.2	181 25.9	45.0	346 58.0	41.6	353 58.0	45.0	Zuben'ubi	137 16.3	S16 02.6
20	61 14.7	71 34.0	10.9	196 26.9	45.4	2 00.5	41.6	9 00.5	45.0		A.H.S. ° ′	Pas. Mer. h m
21	76 17.2	86 34.3	. . 09.7	211 28.0	. . 45.8	17 03.0	. . 41.6	24 03.0	. . 45.0			
22	91 19.6	101 34.6	08.5	226 29.1	46.2	32 05.5	41.7	39 05.4	45.0	Venus	11 55.6	15 14
23	106 22.1	116 34.9	07.3	241 30.1	46.6	47 08.0	41.7	54 07.9	45.0	Marte	136 13.9	6 57
	h m									Júpiter	300 44.0	19 56
Pas. Mer.	15 59.6	v 0.3	d 1.2	v 1.1	d 0.4	v 2.5	d 0.0	v 2.5	d 0.0	Saturno	307 44.8	19 28

T.U.	SOL				LUNA					
	A.H.G.		Dec.		A.H.G.	v	Dec.	d	P.H.	
d h	°	′	°	′	°	′	′	°	′	′	′
19 00	177	20.6	S20	21.9	241	39.4	12.5	S15	56.7	8.6	55.5
01	192	20.4		21.3	256	10.9	12.4	16	05.3	8.5	55.5
02	207	20.2		20.8	270	42.3	12.4	16	13.8	8.5	55.4
03	222	20.0	. .	20.3	285	13.7	12.4	16	22.3	8.4	55.4
04	237	19.8		19.8	299	45.1	12.4	16	30.7	8.2	55.4
05	252	19.6		19.2	314	16.5	12.3	16	38.9	8.2	55.4
06	267	19.4	S20	18.7	328	47.8	12.4	S16	47.1	8.2	55.3
07	282	19.2		18.2	343	19.2	12.3	16	55.3	8.0	55.3
V 08	297	19.0		17.7	357	50.5	12.3	17	03.3	7.9	55.3
I 09	312	18.9	. .	17.1	12	21.8	12.3	17	11.2	7.9	55.3
E 10	327	18.7		16.6	26	53.1	12.2	17	19.1	7.8	55.3
R 11	342	18.5		16.1	41	24.3	12.2	17	26.9	7.7	55.2
N 12	357	18.3	S20	15.5	55	55.5	12.2	S17	34.6	7.6	55.2
E 13	12	18.1		15.0	70	26.7	12.2	17	42.2	7.5	55.2
S 14	27	17.9		14.5	84	57.9	12.2	17	49.7	7.4	55.2
15	42	17.7	. .	13.9	99	29.1	12.1	17	57.1	7.4	55.1
16	57	17.5		13.4	114	00.2	12.1	18	04.5	7.2	55.1
17	72	17.3		12.9	128	31.3	12.1	18	11.7	7.2	55.1
18	87	17.2	S20	12.3	143	02.4	12.1	S18	18.9	7.0	55.1
19	102	17.0		11.8	157	33.5	12.0	18	25.9	7.0	55.1
20	117	16.8		11.3	172	04.5	12.1	18	32.9	6.9	55.0
21	132	16.6	. .	10.7	186	35.6	12.0	18	39.8	6.8	55.0
22	147	16.4		10.2	201	06.6	11.9	18	46.6	6.7	55.0
23	162	16.2		09.7	215	37.5	12.0	18	53.3	6.6	55.0
20 00	177	16.0	S20	09.1	230	08.5	11.9	S18	59.9	6.5	55.0
01	192	15.9		08.6	244	39.4	11.9	19	06.4	6.5	54.9
02	207	15.7		08.0	259	10.3	11.9	19	12.9	6.3	54.9
03	222	15.5	. .	07.5	273	41.2	11.9	19	19.2	6.2	54.9
04	237	15.3		07.0	288	12.1	11.8	19	25.4	6.2	54.9
05	252	15.1		06.4	302	42.9	11.9	19	31.6	6.0	54.9
06	267	14.9	S20	05.9	317	13.8	11.8	S19	37.6	6.0	54.9
S 07	282	14.8		05.3	331	44.6	11.8	19	43.6	5.8	54.8
A 08	297	14.6		04.8	346	15.4	11.7	19	49.4	5.8	54.8
09	312	14.4	. .	04.2	0	46.1	11.8	19	55.2	5.6	54.8
B 10	327	14.2		03.7	15	16.9	11.7	20	00.8	5.6	54.8
11	342	14.0		03.2	29	47.6	11.7	20	06.4	5.5	54.8
A 12	357	13.8	S20	02.6	44	18.3	11.6	S20	11.9	5.3	54.8
13	12	13.7		02.1	58	48.9	11.7	20	17.2	5.3	54.7
D 14	27	13.5		01.5	73	19.6	11.6	20	22.5	5.2	54.7
15	42	13.3	. .	01.0	87	50.2	11.7	20	27.7	5.0	54.7
O 16	57	13.1	20	00.4	102	20.9	11.6	20	32.7	5.0	54.7
17	72	12.9	19	59.9	116	51.5	11.5	20	37.7	4.9	54.7
18	87	12.8	S19	59.3	131	22.0	11.6	S20	42.6	4.8	54.7
19	102	12.6		58.8	145	52.6	11.5	20	47.4	4.6	54.6
20	117	12.4		58.2	160	23.1	11.6	20	52.0	4.6	54.6
21	132	12.2	. .	57.7	174	53.7	11.5	20	56.6	4.5	54.6
22	147	12.0		57.1	189	24.2	11.5	21	01.1	4.3	54.6
23	162	11.9		56.6	203	54.7	11.4	21	05.4	4.3	54.6
21 00	177	11.7	S19	56.0	218	25.1	11.5	S21	09.7	4.2	54.6
01	192	11.5		55.4	232	55.6	11.4	21	13.9	4.0	54.5
02	207	11.3		54.9	247	26.0	11.5	21	17.9	4.0	54.5
03	222	11.2	. .	54.3	261	56.5	11.4	21	21.9	3.8	54.5
04	237	11.0		53.8	276	26.9	11.4	21	25.7	3.8	54.5
05	252	10.8		53.2	290	57.3	11.4	21	29.5	3.6	54.5
06	267	10.6	S19	52.7	305	27.7	11.3	S21	33.1	3.6	54.5
07	282	10.5		52.1	319	58.0	11.4	21	36.7	3.4	54.5
08	297	10.3		51.5	334	28.4	11.3	21	40.1	3.4	54.5
D 09	312	10.1	. .	51.0	348	58.7	11.4	21	43.5	3.2	54.4
O 10	327	09.9		50.4	3	29.1	11.3	21	46.7	3.1	54.4
M 11	342	09.8		49.9	17	59.4	11.3	21	49.8	3.0	54.4
I 12	357	09.6	S19	49.3	32	29.7	11.3	S21	52.8	3.0	54.4
N 13	12	09.4		48.7	47	00.0	11.3	21	55.8	2.8	54.4
G 14	27	09.2		48.2	61	30.3	11.2	21	58.6	2.7	54.4
O 15	42	09.1	. .	47.6	76	00.5	11.3	22	01.3	2.6	54.4
16	57	08.9		47.0	90	30.8	11.3	22	03.9	2.5	54.4
17	72	08.7		46.5	105	01.1	11.2	22	06.4	2.3	54.3
18	87	08.5	S19	45.9	119	31.3	11.3	S22	08.7	2.3	54.3
19	102	08.4		45.3	134	01.6	11.2	22	11.0	2.2	54.3
20	117	08.2		44.8	148	31.8	11.3	22	13.2	2.1	54.3
21	132	08.0	. .	44.2	163	02.1	11.2	22	15.3	1.9	54.3
22	147	07.9		43.6	177	32.3	11.2	22	17.2	1.9	54.3
23	162	07.7		43.1	192	02.5	11.2	S22	19.1	1.7	54.3
	SD	16.3	d	0.5	SD		15.0		14.9		14.8

Lat.	Crepúsculo Náutico	Crepúsculo Civil	Orto Sol	Orto Luna 19	Orto Luna 20	Orto Luna 21	Orto Luna 22
°	h m	h m	h m	h m	h m	h m	h m
N 72	07 48	09 30	▬	06 47	▬	▬	▬
N 70	07 35	09 02	11 04	05 50	▬	▬	▬
68	07 24	08 41	10 09	05 17	07 06	09 15	▬
66	07 15	08 24	09 37	04 53	06 27	07 57	09 10
64	07 08	08 10	09 13	04 34	06 00	07 20	08 25
62	07 01	07 58	08 54	04 19	05 40	06 54	07 56
60	06 55	07 48	08 39	04 06	05 23	06 33	07 33
N 58	06 50	07 39	08 26	03 55	05 09	06 17	07 15
56	06 45	07 31	08 15	03 45	04 57	06 03	07 00
54	06 40	07 24	08 05	03 37	04 46	05 50	06 47
52	06 36	07 18	07 56	03 30	04 37	05 40	06 36
50	06 32	07 12	07 48	03 23	04 29	05 30	06 26
45	06 23	06 59	07 31	03 08	04 11	05 10	06 04
N 40	06 15	06 48	07 18	02 57	03 56	04 54	05 47
35	06 08	06 39	07 06	02 47	03 44	04 40	05 33
30	06 01	06 30	06 56	02 38	03 34	04 28	05 20
20	05 47	06 14	06 38	02 23	03 16	04 08	04 59
N 10	05 34	06 00	06 22	02 10	03 00	03 50	04 40
0	05 20	05 45	06 07	01 58	02 45	03 34	04 23
S 10	05 04	05 30	05 53	01 45	02 31	03 17	04 06
20	04 44	05 13	05 37	01 33	02 15	03 00	03 47
30	04 20	04 51	05 18	01 18	01 57	02 40	03 26
35	04 04	04 39	05 07	01 09	01 47	02 28	03 14
40	03 45	04 23	04 55	01 00	01 35	02 15	02 59
45	03 20	04 05	04 40	00 49	01 21	01 59	02 42
S 50	02 45	03 41	04 21	00 35	01 05	01 40	02 21
52	02 27	03 29	04 13	00 29	00 57	01 31	02 12
54	02 04	03 15	04 03	00 22	00 48	01 20	02 00
56	01 31	02 59	03 52	00 14	00 38	01 09	01 48
58	////	02 40	03 39	00 06	00 27	00 55	01 33
S 60	////	02 15	03 24	24 14	00 14	00 40	01 15

Lat.	Ocaso Sol	Crepúsculo Civil	Crepúsculo Náutico	Ocaso Luna 19	Ocaso Luna 20	Ocaso Luna 21	Ocaso Luna 22
°	h m	h m	h m	h m	h m	h m	h m
N 72	▬	14 53	16 36	09 16	▬	▬	▬
N 70	13 19	15 21	16 48	10 14	▬	▬	▬
68	14 14	15 42	16 59	10 48	10 38	10 11	▬
66	14 46	15 59	17 08	11 13	11 18	11 30	11 59
64	15 10	16 13	17 15	11 33	11 45	12 07	12 44
62	15 28	16 25	17 22	11 49	12 07	12 33	13 13
60	15 44	16 35	17 28	12 02	12 24	12 54	13 36
N 58	15 57	16 44	17 33	12 14	12 38	13 11	13 54
56	16 08	16 51	17 38	12 24	12 51	13 25	14 09
54	16 18	16 58	17 43	12 33	13 02	13 38	14 22
52	16 27	17 05	17 47	12 41	13 11	13 49	14 33
50	16 34	17 11	17 51	12 48	13 20	13 58	14 44
45	16 51	17 23	17 59	13 03	13 38	14 19	15 05
N 40	17 05	17 34	18 07	13 16	13 53	14 35	15 22
35	17 17	17 44	18 15	13 27	14 06	14 49	15 37
30	17 27	17 52	18 22	13 36	14 17	15 02	15 49
20	17 45	18 08	18 35	13 53	14 36	15 22	16 11
N 10	18 00	18 22	18 48	14 07	14 53	15 41	16 29
0	18 15	18 37	19 02	14 20	15 09	15 57	16 47
S 10	18 29	18 52	19 18	14 34	15 24	16 14	17 04
20	18 45	19 09	19 37	14 48	15 41	16 33	17 23
30	19 04	19 30	20 02	15 05	16 00	16 53	17 44
35	19 15	19 43	20 18	15 15	16 11	17 06	17 57
40	19 27	19 58	20 37	15 26	16 24	17 20	18 11
45	19 42	20 17	21 01	15 39	16 40	17 36	18 28
S 50	20 00	20 40	21 35	15 55	16 58	17 57	18 49
52	20 09	20 52	21 53	16 02	17 07	18 07	18 59
54	20 18	21 05	22 16	16 10	17 17	18 18	19 11
56	20 29	21 21	22 47	16 20	17 29	18 31	19 23
58	20 42	21 40	23 56	16 30	17 42	18 45	19 38
S 60	20 56	22 05	////	16 43	17 57	19 03	19 56

Día	SOL E.T. (−) 00h	SOL E.T. (−) 12h	SOL Pas. Mer.	LUNA Pas. Mer. Sup.	LUNA Pas. Mer. Inf.	LUNA Edad	LUNA Fase
d	m s	m s	h m	h m	h m	d %	
19	10 37	10 46	12 11	08 09	20 33	25 22	
20	10 55	11 04	12 11	08 57	21 21	26 14	(
21	11 13	11 21	12 11	09 46	22 10	27 8	

(LUN., MAR., MIE.) 22, 23, 24 ENERO DEL 2001

T.U.	ARIES	VENUS −4.5		MARTE +1.1		JUPITER −2.6		SATURNO +0.0	
	A.H.G.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
22 00	121 24.6	131 35.2	S 4 06.1	256 31.2	S15 47.0	62 10.5	N19 41.7	69 10.4	N16 45.0
01	136 27.0	146 35.5	04.9	271 32.3	47.4	77 13.0	41.7	84 12.9	45.0
02	151 29.5	161 35.8	03.7	286 33.3	47.8	92 15.5	41.7	99 15.4	45.0
03	166 32.0	176 36.1	. . 02.5	301 34.4	. . 48.2	107 18.0	. . 41.7	114 17.8	. . 45.0
04	181 34.4	191 36.4	01.2	316 35.5	48.7	122 20.5	41.7	129 20.3	45.0
05	196 36.9	206 36.7	4 00.0	331 36.5	49.1	137 23.0	41.7	144 22.8	45.0
06	211 39.3	221 37.0	S 3 58.8	346 37.6	S15 49.5	152 25.5	N19 41.7	159 25.3	N16 45.0
07	226 41.8	236 37.4	57.6	1 38.7	49.9	167 28.0	41.7	174 27.8	45.1
08	241 44.3	251 37.7	56.4	16 39.7	50.3	182 30.5	41.7	189 30.3	45.1
L 09	256 46.7	266 38.0	. . 55.2	31 40.8	. . 50.7	197 33.0	. . 41.7	204 32.7	. . 45.1
U 10	271 49.2	281 38.3	54.0	46 41.8	51.1	212 35.5	41.7	219 35.2	45.1
N 11	286 51.7	296 38.6	52.8	61 42.9	51.5	227 37.9	41.7	234 37.7	45.1
E 12	301 54.1	311 38.9	S 3 51.5	76 44.0	S15 51.9	242 40.4	N19 41.7	249 40.2	N16 45.1
13	316 56.6	326 39.2	50.3	91 45.0	52.3	257 42.9	41.7	264 42.6	45.1
S 14	331 59.1	341 39.5	49.1	106 46.1	52.7	272 45.4	41.7	279 45.1	45.1
15	347 01.5	356 39.9	. . 47.9	121 47.2	. . 53.1	287 47.9	. . 41.7	294 47.6	. . 45.1
16	2 04.0	11 40.2	46.7	136 48.2	53.5	302 50.4	41.7	309 50.1	45.1
17	17 06.5	26 40.5	45.5	151 49.3	53.9	317 52.9	41.7	324 52.6	45.1
18	32 08.9	41 40.8	S 3 44.3	166 50.4	S15 54.3	332 55.4	N19 41.8	339 55.0	N16 45.2
19	47 11.4	56 41.1	43.1	181 51.4	54.8	347 57.9	41.8	354 57.5	45.2
20	62 13.8	71 41.4	41.9	196 52.5	55.2	3 00.4	41.8	10 00.0	45.2
21	77 16.3	86 41.8	. . 40.6	211 53.6	. . 55.6	18 02.9	. . 41.8	25 02.5	. . 45.2
22	92 18.8	101 42.1	39.4	226 54.6	56.0	33 05.3	41.8	40 05.0	45.2
23	107 21.2	116 42.4	38.2	241 55.7	56.4	48 07.8	41.8	55 07.4	45.2
23 00	122 23.7	131 42.7	S 3 37.0	256 56.8	S15 56.8	63 10.3	N19 41.8	70 09.9	N16 45.2
01	137 26.2	146 43.1	35.8	271 57.8	57.2	78 12.8	41.8	85 12.4	45.2
02	152 28.6	161 43.4	34.6	286 58.9	57.6	93 15.3	41.8	100 14.9	45.2
03	167 31.1	176 43.7	. . 33.4	302 00.0	. . 58.0	108 17.8	. . 41.8	115 17.3	. . 45.2
04	182 33.6	191 44.1	32.2	317 01.0	58.4	123 20.3	41.8	130 19.8	45.2
05	197 36.0	206 44.4	30.9	332 02.1	58.8	138 22.7	41.8	145 22.3	45.3
06	212 38.5	221 44.7	S 3 29.7	347 03.2	S15 59.2	153 25.2	N19 41.8	160 24.8	N16 45.3
07	227 41.0	236 45.0	28.5	2 04.2	15 59.6	168 27.7	41.8	175 27.2	45.3
M 08	242 43.4	251 45.4	27.3	17 05.3	16 00.0	183 30.2	41.8	190 29.7	45.3
A 09	257 45.9	266 45.7	. . 26.1	32 06.3	. . 00.4	198 32.7	. . 41.8	205 32.2	. . 45.3
R 10	272 48.3	281 46.0	24.9	47 07.4	00.8	213 35.2	41.9	220 34.7	45.3
T 11	287 50.8	296 46.4	23.7	62 08.5	01.2	228 37.7	41.9	235 37.1	45.3
E 12	302 53.3	311 46.7	S 3 22.5	77 09.5	S16 01.6	243 40.1	N19 41.9	250 39.6	N16 45.3
13	317 55.7	326 47.1	21.3	92 10.6	02.0	258 42.6	41.9	265 42.1	45.3
S 14	332 58.2	341 47.4	20.0	107 11.7	02.4	273 45.1	41.9	280 44.6	45.3
15	348 00.7	356 47.7	. . 18.8	122 12.7	. . 02.8	288 47.6	. . 41.9	295 47.0	. . 45.4
16	3 03.1	11 48.1	17.6	137 13.8	03.2	303 50.1	41.9	310 49.5	45.4
17	18 05.6	26 48.4	16.4	152 14.9	03.6	318 52.6	41.9	325 52.0	45.4
18	33 08.1	41 48.8	S 3 15.2	167 15.9	S16 04.0	333 55.0	N19 41.9	340 54.5	N16 45.4
19	48 10.5	56 49.1	14.0	182 17.0	04.4	348 57.5	41.9	355 56.9	45.4
20	63 13.0	71 49.4	12.8	197 18.1	04.8	4 00.0	41.9	10 59.4	45.4
21	78 15.5	86 49.8	. . 11.6	212 19.1	. . 05.2	19 02.5	. . 41.9	26 01.9	. . 45.4
22	93 17.9	101 50.1	10.4	227 20.2	05.6	34 05.0	41.9	41 04.3	45.4
23	108 20.4	116 50.5	09.1	242 21.3	06.0	49 07.4	41.9	56 06.8	45.4
24 00	123 22.8	131 50.8	S 3 07.9	257 22.3	S16 06.4	64 09.9	N19 42.0	71 09.3	N16 45.4
01	138 25.3	146 51.2	06.7	272 23.4	06.8	79 12.4	42.0	86 11.8	45.5
02	153 27.8	161 51.5	05.5	287 24.5	07.2	94 14.9	42.0	101 14.2	45.5
03	168 30.2	176 51.9	. . 04.3	302 25.5	. . 07.6	109 17.3	. . 42.0	116 16.7	. . 45.5
04	183 32.7	191 52.2	03.1	317 26.6	08.0	124 19.8	42.0	131 19.2	45.5
05	198 35.2	206 52.6	01.9	332 27.7	08.4	139 22.3	42.0	146 21.7	45.5
06	213 37.6	221 52.9	S 3 00.7	347 28.7	S16 08.8	154 24.8	N19 42.0	161 24.1	N16 45.5
07	228 40.1	236 53.3	2 59.5	2 29.8	09.2	169 27.3	42.0	176 26.6	45.5
M 08	243 42.6	251 53.7	58.3	17 30.9	09.6	184 29.7	42.0	191 29.1	45.5
I 09	258 45.0	266 54.0	. . 57.0	32 31.9	. . 10.0	199 32.2	. . 42.0	206 31.5	. . 45.5
E 10	273 47.5	281 54.4	55.8	47 33.0	10.4	214 34.7	42.0	221 34.0	45.5
R 11	288 49.9	296 54.7	54.6	62 34.1	10.8	229 37.2	42.0	236 36.5	45.6
C 12	303 52.4	311 55.1	S 2 53.4	77 35.1	S16 11.2	244 39.6	N19 42.1	251 38.9	N16 45.6
O 13	318 54.9	326 55.5	52.2	92 36.2	11.6	259 42.1	42.1	266 41.4	45.6
L 14	333 57.3	341 55.8	51.0	107 37.3	12.0	274 44.6	42.1	281 43.9	45.6
E 15	348 59.8	356 56.2	. . 49.8	122 38.3	. . 12.4	289 47.0	. . 42.1	296 46.4	. . 45.6
S 16	4 02.3	11 56.6	48.6	137 39.4	12.8	304 49.5	42.1	311 48.8	45.6
17	19 04.7	26 56.9	47.4	152 40.5	13.2	319 52.0	42.1	326 51.3	45.6
18	34 07.2	41 57.3	S 2 46.2	167 41.5	S16 13.6	334 54.5	N19 42.1	341 53.8	N16 45.6
19	49 09.7	56 57.7	44.9	182 42.6	14.0	349 56.9	42.1	356 56.2	45.6
20	64 12.1	71 58.0	43.7	197 43.7	14.4	4 59.4	42.1	11 58.7	45.7
21	79 14.6	86 58.4	. . 42.5	212 44.8	. . 14.8	20 01.9	. . 42.1	27 01.2	. . 45.7
22	94 17.1	101 58.8	41.3	227 45.8	15.2	35 04.3	42.1	42 03.6	45.7
23	109 19.5	116 59.1	40.1	242 46.9	15.6	50 06.8	42.2	57 06.1	45.7
	h m								
Pas. Mer.	15 47.8	v 0.3	d 1.2	v 1.1	d 0.4	v 2.5	d 0.0	v 2.5	d 0.0

ESTRELLAS

Nombre	A.H.S.	Dec.
	° ′	° ′
Acamar	315 25.6	S40 18.4
Achernar	335 34.0	S57 14.3
Acrux	173 20.0	S63 06.0
Adhara	255 19.8	S28 58.5
Aldebaran	291 00.3	N16 30.6
Alioth	166 28.9	N55 57.0
Alkaid	153 06.5	N49 18.3
Al Na'ir	27 56.3	S46 57.6
Alnilam	275 56.0	S 1 12.2
Alphard	218 05.3	S 8 39.8
Alphecca	126 19.4	N26 42.6
Alpheratz	357 53.8	N29 05.8
Altair	62 18.0	N 8 52.2
Ankaa	353 25.4	S42 18.4
Antares	112 38.4	S26 25.9
Arcturus	146 04.6	N19 10.5
Atria	107 49.4	S69 01.5
Avior	234 21.4	S59 30.8
Bellatrix	278 42.2	N 6 20.9
Betelgeuse	271 11.5	N 7 24.3
Canopus	264 00.0	S52 42.0
Capella	280 48.4	N46 00.0
Deneb	49 38.6	N45 17.0
Denebola	182 43.3	N14 33.9
Diphda	349 05.7	S17 59.1
Dubhe	194 03.0	N61 44.6
Elnath	278 24.6	N28 36.5
Eltanin	90 51.1	N51 29.2
Enif	33 57.0	N 9 52.7
Fomalhaut	15 34.9	S29 37.3
Gacrux	172 11.6	S57 06.8
Gienah	176 02.1	S17 32.7
Hadar	149 01.8	S60 22.3
Hamal	328 11.7	N23 28.0
Kaus Aust.	83 57.0	S34 23.0
Kochab	137 19.8	N74 08.8
Markab	13 48.3	N15 12.6
Menkar	314 25.1	N 4 05.5
Menkent	148 19.1	S36 22.3
Miaplacidus	221 40.9	S69 43.2
Mirfak	308 54.1	N49 52.0
Nunki	76 10.7	S26 17.7
Peacock	53 35.0	S56 44.0
Pollux	243 39.2	N28 01.4
Procyon	245 09.5	N 5 13.3
Rasalhague	96 15.7	N12 33.5
Regulus	207 53.5	N11 57.7
Rigel	281 21.1	S 8 12.2
Rigil Kent.	140 05.2	S60 50.0
Sabik	102 23.9	S15 43.5
Schedar	349 51.9	N56 32.7
Shaula	96 35.4	S37 06.2
Sirius	258 42.0	S16 43.2
Spica	158 41.4	S11 09.9
Suhail	222 59.2	S43 26.2
Vega	80 45.9	N38 47.0
Zuben'ubi	137 16.3	S16 02.6

	A.H.S.	Pas. Mer.
	° ′	h m
Venus	9 19.0	15 13
Marte	134 33.1	6 52
Júpiter	300 46.6	19 44
Saturno	307 46.2	19 16

T.U.	SOL				LUNA						
	A.H.G.		Dec.		A.H.G.		v	Dec.		d	PH.
d h	°	′	°	′	°	′	′	°	′	′	′
22 00	177	07.5	S19	42.5	206	32.7	11.2	S22	20.8	1.7	54.3
01	192	07.4		41.9	221	02.9	11.3	22	22.5	1.5	54.3
02	207	07.2		41.4	235	33.2	11.2	22	24.0	1.4	54.2
03	222	07.0	. .	40.8	250	03.4	11.2	22	25.4	1.3	54.2
04	237	06.8		40.2	264	33.6	11.2	22	26.7	1.3	54.2
05	252	06.7		39.6	279	03.8	11.2	22	28.0	1.1	54.2
06	267	06.5	S19	39.1	293	34.0	11.2	S22	29.1	1.0	54.2
07	282	06.3		38.5	308	04.2	11.2	22	30.1	0.8	54.2
08	297	06.2		37.9	322	34.4	11.2	22	30.9	0.8	54.2
L 09	312	06.0	. .	37.3	337	04.6	11.3	22	31.7	0.7	54.2
U 10	327	05.8		36.8	351	34.9	11.2	22	32.4	0.6	54.2
N 11	342	05.7		36.2	6	05.1	11.2	22	33.0	0.4	54.2
12	357	05.5	S19	35.6	20	35.3	11.2	S22	33.4	0.4	54.2
E 13	12	05.3		35.0	35	05.5	11.3	22	33.8	0.2	54.1
14	27	05.2		34.5	49	35.8	11.2	22	34.0	0.2	54.1
S 15	42	05.0	. .	33.9	64	06.0	11.2	22	34.2	0.0	54.1
16	57	04.8		33.3	78	36.2	11.3	22	34.2	0.1	54.1
17	72	04.7		32.7	93	06.5	11.3	22	34.1	0.2	54.1
18	87	04.5	S19	32.1	107	36.8	11.2	S22	33.9	0.3	54.1
19	102	04.4		31.6	122	07.0	11.3	22	33.6	0.4	54.1
20	117	04.2		31.0	136	37.3	11.3	22	33.2	0.5	54.1
21	132	04.0	. .	30.4	151	07.6	11.3	22	32.7	0.6	54.1
22	147	03.9		29.8	165	37.9	11.3	22	32.1	0.7	54.1
23	162	03.7		29.2	180	08.2	11.3	22	31.4	0.8	54.1
23 00	177	03.5	S19	28.6	194	38.5	11.4	S22	30.6	0.9	54.1
01	192	03.4		28.1	209	08.9	11.3	22	29.7	1.1	54.1
02	207	03.2		27.5	223	39.2	11.4	22	28.6	1.1	54.1
03	222	03.1	. .	26.9	238	09.6	11.3	22	27.5	1.3	54.1
04	237	02.9		26.3	252	39.9	11.4	22	26.2	1.3	54.0
05	252	02.7		25.7	267	10.3	11.4	22	24.9	1.5	54.0
06	267	02.6	S19	25.1	281	40.7	11.5	S22	23.4	1.5	54.0
07	282	02.4		24.5	296	11.2	11.4	22	21.9	1.7	54.0
M 08	297	02.3		23.9	310	41.6	11.5	22	20.2	1.8	54.0
09	312	02.1	. .	23.3	325	12.1	11.5	22	18.4	1.9	54.0
A 10	327	01.9		22.8	339	42.6	11.5	22	16.5	1.9	54.0
R 11	342	01.8		22.2	354	13.1	11.5	22	14.6	2.1	54.0
T 12	357	01.6	S19	21.6	8	43.6	11.5	S22	12.5	2.2	54.0
E 13	12	01.5		21.0	23	14.1	11.6	22	10.3	2.3	54.0
S 14	27	01.3		20.4	37	44.7	11.6	22	08.0	2.4	54.0
15	42	01.2	. .	19.8	52	15.3	11.6	22	05.6	2.5	54.0
16	57	01.0		19.2	66	45.9	11.6	22	03.1	2.6	54.0
17	72	00.8		18.6	81	16.5	11.6	22	00.5	2.7	54.0
18	87	00.7	S19	18.0	95	47.1	11.7	S21	57.8	2.8	54.0
19	102	00.5		17.4	110	17.8	11.7	21	55.0	2.9	54.0
20	117	00.4		16.8	124	48.5	11.7	21	52.1	3.0	54.0
21	132	00.2	. .	16.2	139	19.2	11.8	21	49.1	3.1	54.0
22	147	00.1		15.6	153	50.0	11.8	21	46.0	3.3	54.0
23	161	59.9		15.0	168	20.8	11.8	21	42.7	3.3	54.0
24 00	176	59.8	S19	14.4	182	51.6	11.8	S21	39.4	3.4	54.0
01	191	59.6		13.8	197	22.4	11.8	21	36.0	3.5	54.0
02	206	59.5		13.2	211	53.2	11.9	21	32.5	3.6	54.0
03	221	59.3	. .	12.6	226	24.1	11.9	21	28.9	3.7	54.0
04	236	59.1		12.0	240	55.0	12.0	21	25.2	3.8	53.9
05	251	59.0		11.4	255	26.0	12.0	21	21.4	3.9	53.9
06	266	58.8	S19	10.8	269	57.0	12.0	S21	17.5	4.0	53.9
M 07	281	58.7		10.2	284	28.0	12.0	21	13.5	4.1	53.9
I 08	296	58.5		09.6	298	59.0	12.1	21	09.4	4.2	53.9
E 09	311	58.4	. .	09.0	313	30.1	12.1	21	05.2	4.3	53.9
R 10	326	58.2		08.4	328	01.2	12.1	21	00.9	4.4	53.9
C 11	341	58.1		07.8	342	32.3	12.2	20	56.5	4.5	53.9
O 12	356	57.9	S19	07.2	357	03.5	12.1	S20	52.0	4.5	53.9
L 13	11	57.8		06.6	11	34.6	12.3	20	47.5	4.7	53.9
E 14	26	57.6		06.0	26	05.9	12.2	20	42.8	4.8	53.9
S 15	41	57.5	. .	05.3	40	37.1	12.3	20	38.0	4.8	53.9
16	56	57.3		04.7	55	08.4	12.4	20	33.2	5.0	53.9
17	71	57.2		04.1	69	39.8	12.3	20	28.2	5.0	53.9
18	86	57.1	S19	03.5	84	11.1	12.4	S20	23.2	5.2	53.9
19	101	56.9		02.9	98	42.5	12.4	20	18.0	5.2	53.9
20	116	56.8		02.3	113	13.9	12.5	20	12.8	5.3	53.9
21	131	56.6	. .	01.7	127	45.4	12.5	20	07.5	5.4	53.9
22	146	56.5		01.1	142	16.9	12.5	20	02.1	5.5	53.9
23	161	56.3		00.5	156	48.4	12.6	S19	56.6	5.6	53.9
	SD	16.3	d	0.6	SD		14.8		14.7		14.7

Lat.	Crepúsculo Náutico	Crepúsculo Civil	Orto Sol	Orto Luna 22	Orto Luna 23	Orto Luna 24	Orto Luna 25
°	h m	h m	h m	h m	h m	h m	h m
N 72	07 39	09 18	▬	▬	▬	▬	▬
N 70	07 27	08 52	10 40	▬	▬	▬	11 32
68	07 18	08 32	09 56	▬	▬	10 58	10 46
66	07 10	08 17	09 27	09 10	09 51	10 08	10 15
64	07 03	08 04	09 05	08 25	09 10	09 37	09 52
62	06 56	07 53	08 48	07 56	08 42	09 13	09 34
60	06 51	07 43	08 33	07 33	08 20	08 55	09 19
N 58	06 46	07 35	08 21	07 15	08 03	08 39	09 06
56	06 41	07 27	08 10	07 00	07 48	08 26	08 55
54	06 37	07 21	08 01	06 47	07 35	08 14	08 45
52	06 33	07 15	07 53	06 36	07 24	08 04	08 36
50	06 30	07 09	07 45	06 26	07 14	07 54	08 28
45	06 21	06 57	07 29	06 04	06 53	07 35	08 11
N 40	06 14	06 47	07 16	05 47	06 36	07 19	07 58
35	06 07	06 37	07 05	05 33	06 22	07 06	07 46
30	06 00	06 29	06 55	05 20	06 09	06 54	07 36
20	05 47	06 14	06 38	04 59	05 48	06 34	07 18
N 10	05 35	06 00	06 22	04 40	05 29	06 17	07 02
0	05 21	05 46	06 08	04 23	05 12	06 01	06 48
S 10	05 05	05 32	05 54	04 06	04 55	05 44	06 33
20	04 47	05 15	05 39	03 47	04 36	05 27	06 18
30	04 23	04 54	05 21	03 26	04 15	05 07	06 00
35	04 07	04 42	05 10	03 14	04 03	04 55	05 49
40	03 49	04 27	04 58	02 59	03 48	04 42	05 37
45	03 25	04 09	04 44	02 42	03 31	04 25	05 23
S 50	02 53	03 46	04 26	02 21	03 10	04 06	05 06
52	02 35	03 35	04 18	02 12	03 00	03 56	04 58
54	02 14	03 22	04 09	02 00	02 49	03 46	04 49
56	01 45	03 07	03 58	01 48	02 36	03 34	04 38
58	00 56	02 49	03 46	01 33	02 21	03 20	04 27
S 60	////	02 26	03 32	01 15	02 04	03 04	04 13

Lat.	Ocaso Sol	Crepúsculo Civil	Crepúsculo Náutico	Ocaso Luna 22	Ocaso Luna 23	Ocaso Luna 24	Ocaso Luna 25
°	h m	h m	h m	h m	h m	h m	h m
N 72	▬	15 07	16 46	▬	▬	▬	▬
N 70	13 45	15 33	16 58	▬	▬	▬	14 37
68	14 29	15 52	17 07	▬	▬	13 33	15 23
66	14 58	16 08	17 15	11 59	13 00	14 23	15 53
64	15 19	16 21	17 22	12 44	13 41	14 54	16 15
62	15 37	16 32	17 28	13 13	14 08	15 17	16 33
60	15 51	16 41	17 34	13 36	14 30	15 35	16 48
N 58	16 03	16 50	17 39	13 54	14 47	15 51	17 00
56	16 14	16 57	17 43	14 09	15 02	16 04	17 11
54	16 23	17 04	17 47	14 22	15 15	16 15	17 20
52	16 32	17 10	17 51	14 33	15 26	16 25	17 28
50	16 39	17 15	17 55	14 44	15 36	16 34	17 36
45	16 55	17 27	18 03	15 05	15 57	16 53	17 52
N 40	17 08	17 38	18 11	15 22	16 13	17 08	18 05
35	17 20	17 47	18 17	15 37	16 28	17 21	18 16
30	17 29	17 55	18 24	15 49	16 40	17 32	18 26
20	17 46	18 10	18 37	16 11	17 01	17 51	18 42
N 10	18 01	18 24	18 49	16 29	17 19	18 08	18 57
0	18 15	18 37	19 03	16 47	17 36	18 24	19 10
S 10	18 30	18 52	19 18	17 04	17 53	18 39	19 24
20	18 45	19 09	19 37	17 23	18 11	18 56	19 38
30	19 03	19 29	20 01	17 44	18 31	19 14	19 54
35	19 13	19 41	20 16	17 57	18 43	19 25	20 03
40	19 25	19 56	20 34	18 11	18 57	19 38	20 14
45	19 39	20 14	20 58	18 28	19 14	19 53	20 26
S 50	19 57	20 36	21 30	18 49	19 34	20 11	20 42
52	20 05	20 47	21 46	18 59	19 43	20 19	20 49
54	20 14	21 00	22 07	19 11	19 54	20 29	20 56
56	20 24	21 15	22 35	19 23	20 06	20 39	21 05
58	20 36	21 33	23 20	19 38	20 20	20 52	21 15
S 60	20 50	21 55	////	19 56	20 37	21 06	21 26

Día	SOL E.T. (−) 00h	SOL E.T. (−) 12h	SOL Pas. Mer.	LUNA Pas. Mer. Sup.	LUNA Pas. Mer. Inf.	LUNA Edad	LUNA Fase
d	m s	m s	h m	h m	h m	d	%
22	11 30	11 38	12 12	10 35	22 59	28	4
23	11 46	11 53	12 12	11 24	23 48	29	1
24	12 01	12 08	12 12	12 12	24 36	30	0

(JUE., VIE., SAB.) 25, 26, 27 ENERO DEL 2001

T.U.	ARIES	VENUS −4.5		MARTE +1.1		JUPITER −2.5		SATURNO +0.1	
	A.H.G.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
25 00	124 22.0	131 59.5	S 2 38.9	257 48.0	S16 16.0	65 09.3	N19 42.2	72 08.6	N16 45.7
01	139 24.4	146 59.9	37.7	272 49.0	16.4	80 11.8	42.2	87 11.0	45.7
02	154 26.9	162 00.3	36.5	287 50.1	16.8	95 14.2	42.2	102 13.5	45.7
03	169 29.4	177 00.6	. . 35.3	302 51.2	. . 17.2	110 16.7	. . 42.2	117 16.0	. . 45.7
04	184 31.8	192 01.0	34.1	317 52.2	17.6	125 19.2	42.2	132 18.4	45.8
05	199 34.3	207 01.4	32.9	332 53.3	17.9	140 21.6	42.2	147 20.9	45.8
06	214 36.8	222 01.8	S 2 31.6	347 54.4	S16 18.3	155 24.1	N19 42.2	162 23.4	N16 45.8
07	229 39.2	237 02.1	30.4	2 55.4	18.7	170 26.6	42.2	177 25.8	45.8
J 08	244 41.7	252 02.5	29.2	17 56.5	19.1	185 29.0	42.2	192 28.3	45.8
U 09	259 44.2	267 02.9	. . 28.0	32 57.6	. . 19.5	200 31.5	. . 42.3	207 30.8	. . 45.8
E 10	274 46.6	282 03.3	26.8	47 58.6	19.9	215 34.0	42.3	222 33.2	45.8
V 11	289 49.1	297 03.7	25.6	62 59.7	20.3	230 36.4	42.3	237 35.7	45.8
E 12	304 51.6	312 04.1	S 2 24.4	78 00.8	S16 20.7	245 38.9	N19 42.3	252 38.2	N16 45.8
S 13	319 54.0	327 04.5	23.2	93 01.8	21.1	260 41.4	42.3	267 40.6	45.9
14	334 56.5	342 04.8	22.0	108 02.9	21.5	275 43.8	42.3	282 43.1	45.9
15	349 58.9	357 05.2	. . 20.8	123 04.0	. . 21.9	290 46.3	. . 42.3	297 45.6	. . 45.9
16	5 01.4	12 05.6	19.6	138 05.0	22.3	305 48.8	42.3	312 48.0	45.9
17	20 03.9	27 06.0	18.4	153 06.1	22.7	320 51.2	42.3	327 50.5	45.9
18	35 06.3	42 06.4	S 2 17.1	168 07.2	S16 23.1	335 53.7	N19 42.4	342 52.9	N16 45.9
19	50 08.8	57 06.8	15.9	183 08.3	23.4	350 56.1	42.4	357 55.4	45.9
20	65 11.3	72 07.2	14.7	198 09.3	23.8	5 58.6	42.4	12 57.9	45.9
21	80 13.7	87 07.6	. . 13.5	213 10.4	. . 24.2	21 01.1	. . 42.4	28 00.3	. . 46.0
22	95 16.2	102 08.0	12.3	228 11.5	24.6	36 03.5	42.4	43 02.8	46.0
23	110 18.7	117 08.4	11.1	243 12.5	25.0	51 06.0	42.4	58 05.3	46.0
26 00	125 21.1	132 08.8	S 2 09.9	258 13.6	S16 25.4	66 08.5	N19 42.4	73 07.7	N16 46.0
01	140 23.6	147 09.2	08.7	273 14.7	25.8	81 10.9	42.4	88 10.2	46.0
02	155 26.1	162 09.6	07.5	288 15.7	26.2	96 13.4	42.4	103 12.6	46.0
03	170 28.5	177 10.0	. . 06.3	303 16.8	. . 26.6	111 15.8	. . 42.5	118 15.1	. . 46.0
04	185 31.0	192 10.4	05.1	318 17.9	27.0	126 18.3	42.5	133 17.6	46.1
05	200 33.4	207 10.8	03.9	333 18.9	27.4	141 20.8	42.5	148 20.0	46.1
06	215 35.9	222 11.2	S 2 02.7	348 20.0	S16 27.7	156 23.2	N19 42.5	163 22.5	N16 46.1
07	230 38.4	237 11.6	01.5	3 21.1	28.1	171 25.7	42.5	178 25.0	46.1
V 08	245 40.8	252 12.0	2 00.3	18 22.2	28.5	186 28.1	42.5	193 27.4	46.1
I 09	260 43.3	267 12.4	1 59.0	33 23.2	. . 28.9	201 30.6	. . 42.5	208 29.9	. . 46.1
E 10	275 45.8	282 12.8	57.8	48 24.3	29.3	216 33.0	42.5	223 32.3	46.1
R 11	290 48.2	297 13.2	56.6	63 25.4	29.7	231 35.5	42.5	238 34.8	46.1
N 12	305 50.7	312 13.6	S 1 55.4	78 26.4	S16 30.1	246 38.0	N19 42.6	253 37.3	N16 46.2
E 13	320 53.2	327 14.0	54.2	93 27.5	30.5	261 40.4	42.6	268 39.7	46.2
S 14	335 55.6	342 14.5	53.0	108 28.6	30.9	276 42.9	42.6	283 42.2	46.2
15	350 58.1	357 14.9	. . 51.8	123 29.6	. . 31.2	291 45.3	. . 42.6	298 44.6	. . 46.2
16	6 00.5	12 15.3	50.6	138 30.7	31.6	306 47.8	42.6	313 47.1	46.2
17	21 03.0	27 15.7	49.4	153 31.8	32.0	321 50.2	42.6	328 49.6	46.2
18	36 05.5	42 16.1	S 1 48.2	168 32.9	S16 32.4	336 52.7	N19 42.6	343 52.0	N16 46.2
19	51 07.9	57 16.5	47.0	183 33.9	32.8	351 55.1	42.6	358 54.5	46.3
20	66 10.4	72 17.0	45.8	198 35.0	33.2	6 57.6	42.7	13 56.9	46.3
21	81 12.9	87 17.4	. . 44.6	213 36.1	. . 33.6	22 00.0	. . 42.7	28 59.4	. . 46.3
22	96 15.3	102 17.8	43.4	228 37.1	34.0	37 02.5	42.7	44 01.8	46.3
23	111 17.8	117 18.2	42.2	243 38.2	34.3	52 04.9	42.7	59 04.3	46.3
27 00	126 20.3	132 18.6	S 1 41.0	258 39.3	S16 34.7	67 07.4	N19 42.7	74 06.8	N16 46.3
01	141 22.7	147 19.1	39.8	273 40.3	35.1	82 09.9	42.7	89 09.2	46.3
02	156 25.2	162 19.5	38.6	288 41.4	35.5	97 12.3	42.7	104 11.7	46.3
03	171 27.7	177 19.9	. . 37.4	303 42.5	. . 35.9	112 14.8	. . 42.7	119 14.1	. . 46.4
04	186 30.1	192 20.3	36.2	318 43.6	36.3	127 17.2	42.8	134 16.6	46.4
05	201 32.6	207 20.8	35.0	333 44.6	36.7	142 19.7	42.8	149 19.0	46.4
06	216 35.0	222 21.2	S 1 33.7	348 45.7	S16 37.0	157 22.1	N19 42.8	164 21.5	N16 46.4
07	231 37.5	237 21.6	32.5	3 46.8	37.4	172 24.6	42.8	179 24.0	46.4
S 08	246 40.0	252 22.1	31.3	18 47.8	37.8	187 27.0	42.8	194 26.4	46.4
A 09	261 42.4	267 22.5	. . 30.1	33 48.9	. . 38.2	202 29.4	. . 42.8	209 28.9	. . 46.4
B 10	276 44.9	282 22.9	28.9	48 50.0	38.6	217 31.9	42.8	224 31.3	46.5
A 11	291 47.4	297 23.4	27.7	63 51.1	39.0	232 34.3	42.9	239 33.8	46.5
A 12	306 49.8	312 23.8	S 1 26.5	78 52.1	S16 39.3	247 36.8	N19 42.9	254 36.2	N16 46.5
D 13	321 52.3	327 24.2	25.3	93 53.2	39.7	262 39.2	42.9	269 38.7	46.5
O 14	336 54.8	342 24.7	24.1	108 54.3	40.1	277 41.7	42.9	284 41.2	46.5
15	351 57.2	357 25.1	. . 22.9	123 55.3	. . 40.5	292 44.1	. . 42.9	299 43.6	. . 46.5
16	6 59.7	12 25.6	21.7	138 56.4	40.9	307 46.6	42.9	314 46.1	46.5
17	22 02.1	27 26.0	20.5	153 57.5	41.3	322 49.0	42.9	329 48.5	46.6
18	37 04.6	42 26.4	S 1 19.3	168 58.6	S16 41.6	337 51.5	N19 43.0	344 51.0	N16 46.6
19	52 07.1	57 26.9	18.1	183 59.6	42.0	352 53.9	43.0	359 53.4	46.6
20	67 09.5	72 27.3	16.9	199 00.7	42.4	7 56.4	43.0	14 55.9	46.6
21	82 12.0	87 27.8	. . 15.7	214 01.8	. . 42.8	22 58.8	. . 43.0	29 58.3	. . 46.6
22	97 14.5	102 28.2	14.5	229 02.8	43.2	38 01.2	43.0	45 00.8	46.6
23	112 16.9	117 28.7	13.3	244 03.9	43.6	53 03.7	43.0	60 03.2	46.7
	h m								
Pas. Mer.	15 36.0	v 0.4	d 1.2	v 1.1	d 0.4	v 2.5	d 0.0	v 2.5	d 0.0

ESTRELLAS

Nombre	A.H.S.	Dec.
	° ′	° ′
Acamar	315 25.6	S40 18.4
Achernar	335 34.0	S57 14.3
Acrux	173 19.9	S63 06.0
Adhara	255 19.8	S28 58.6
Aldebaran	291 00.3	N16 30.6
Alioth	166 28.9	N55 57.0
Alkaid	153 06.4	N49 18.3
Al Na'ir	27 56.3	S46 57.6
Alnilam	275 56.0	S 1 12.2
Alphard	218 05.3	S 8 39.8
Alphecca	126 19.3	N26 42.5
Alpheratz	357 53.8	N29 05.7
Altair	62 18.0	N 8 52.2
Ankaa	353 25.4	S42 18.4
Antares	112 38.4	S26 25.9
Arcturus	146 04.6	N19 10.5
Atria	107 49.4	S69 01.5
Avior	234 21.4	S59 30.8
Bellatrix	278 42.2	N 6 20.9
Betelgeuse	271 11.5	N 7 24.3
Canopus	264 00.0	S52 42.0
Capella	280 48.5	N46 00.0
Deneb	49 38.6	N45 17.0
Denebola	182 43.3	N14 33.9
Diphda	349 05.7	S17 59.1
Dubhe	194 02.9	N61 44.6
Elnath	278 24.6	N28 36.5
Eltanin	90 51.1	N51 29.2
Enif	33 57.0	N 9 52.7
Fomalhaut	15 34.9	S29 37.3
Gacrux	172 11.5	S57 06.8
Gienah	176 02.1	S17 32.8
Hadar	149 01.7	S60 22.3
Hamal	328 11.7	N23 28.0
Kaus Aust.	83 57.0	S34 23.0
Kochab	137 19.7	N74 08.8
Markab	13 48.3	N15 12.6
Menkar	314 25.1	N 4 05.5
Menkent	148 19.0	S36 22.3
Miaplacidus	221 40.9	S69 43.2
Mirfak	308 54.1	N49 52.0
Nunki	76 10.7	S26 17.7
Peacock	53 35.0	S56 44.0
Pollux	243 39.2	N28 01.4
Procyon	245 09.5	N 5 13.3
Rasalhague	96 15.7	N12 33.5
Regulus	207 53.5	N11 57.7
Rigel	281 21.1	S 8 12.2
Rigil Kent.	140 05.2	S60 50.0
Sabik	102 23.9	S15 43.5
Schedar	349 51.9	N56 32.7
Shaula	96 35.4	S37 06.2
Sirius	258 42.0	S16 43.2
Spica	158 41.4	S11 09.9
Suhail	222 59.2	S43 26.2
Vega	80 45.9	N38 47.0
Zuben'ubi	137 16.2	S16 02.7

	A.H.S.	Pas. Mer.
	° ′	h m
Venus	6 47.7	15 11
Marte	132 52.5	6 47
Júpiter	300 47.3	19 32
Saturno	307 46.6	19 04

(JUE., VIE., SAB.) 25, 26, 27 ENERO DEL 2001

T.U.	SOL				LUNA					
	A.H.G.		Dec.		A.H.G.	v	Dec.	d	P.H.	
d h	°	′	°	′	°	′	°	′	′	′
25 00	176	56.2	S18	59.8	171	20.0	12.6	S19	51.0	5.7	53.9
01	191	56.0		59.2	185	51.6	12.7	19	45.3	5.7	53.9
02	206	55.9		58.6	200	23.3	12.7	19	39.6	5.9	53.9
03	221	55.7	. .	58.0	214	55.0	12.7	19	33.7	5.9	53.9
04	236	55.6		57.4	229	26.7	12.7	19	27.8	6.0	53.9
05	251	55.5		56.8	243	58.4	12.8	19	21.8	6.2	53.9
06	266	55.3	S18	56.1	258	30.2	12.9	S19	15.6	6.1	53.9
J 07	281	55.2		55.5	273	02.1	12.8	19	09.5	6.3	53.9
08	296	55.0		54.9	287	33.9	12.9	19	03.2	6.4	53.9
U 09	311	54.9	. .	54.3	302	05.8	13.0	18	56.8	6.4	53.9
10	326	54.7		53.7	316	37.8	13.0	18	50.4	6.6	53.9
E 11	341	54.6		53.0	331	09.8	13.0	18	43.8	6.6	54.0
V 12	356	54.5	S18	52.4	345	41.8	13.0	S18	37.2	6.7	54.0
13	11	54.3		51.8	0	13.8	13.1	18	30.5	6.8	54.0
E 14	26	54.2		51.2	14	45.9	13.2	18	23.7	6.8	54.0
15	41	54.0	. .	50.6	29	18.1	13.1	18	16.9	7.0	54.0
S 16	56	53.9		49.9	43	50.2	13.3	18	09.9	7.0	54.0
17	71	53.8		49.3	58	22.5	13.2	18	02.9	7.1	54.0
18	86	53.6	S18	48.7	72	54.7	13.3	S17	55.8	7.2	54.0
19	101	53.5		48.1	87	27.0	13.3	17	48.6	7.2	54.0
20	116	53.3		47.4	101	59.3	13.4	17	41.4	7.4	54.0
21	131	53.2	. .	46.8	116	31.7	13.4	17	34.0	7.4	54.0
22	146	53.1		46.2	131	04.1	13.4	17	26.6	7.4	54.0
23	161	52.9		45.5	145	36.5	13.5	17	19.2	7.6	54.0
26 00	176	52.8	S18	44.9	160	09.0	13.5	S17	11.6	7.6	54.0
01	191	52.6		44.3	174	41.5	13.5	17	04.0	7.7	54.0
02	206	52.5		43.7	189	14.0	13.6	16	56.3	7.8	54.0
03	221	52.4	. .	43.0	203	46.6	13.7	16	48.5	7.9	54.0
04	236	52.2		42.4	218	19.3	13.6	16	40.6	7.9	54.0
05	251	52.1		41.8	232	51.9	13.7	16	32.7	8.0	54.0
06	266	52.0	S18	41.1	247	24.6	13.8	S16	24.7	8.1	54.0
07	281	51.8		40.5	261	57.4	13.7	16	16.6	8.1	54.0
V 08	296	51.7		39.9	276	30.1	13.8	16	08.5	8.2	54.0
I 09	311	51.6	. .	39.2	291	02.9	13.9	16	00.3	8.3	54.0
E 10	326	51.4		38.6	305	35.8	13.9	15	52.0	8.4	54.0
R 11	341	51.3		38.0	320	08.7	13.9	15	43.6	8.4	54.1
N 12	356	51.2	S18	37.3	334	41.6	13.9	S15	35.2	8.5	54.1
E 13	11	51.0		36.7	349	14.5	14.0	15	26.7	8.5	54.1
S 14	26	50.9		36.1	3	47.5	14.1	15	18.2	8.6	54.1
15	41	50.8	. .	35.4	18	20.6	14.0	15	09.6	8.7	54.1
16	56	50.6		34.8	32	53.6	14.1	15	00.9	8.8	54.1
17	71	50.5		34.1	47	26.7	14.1	14	52.1	8.8	54.1
18	86	50.4	S18	33.5	61	59.8	14.2	S14	43.3	8.8	54.1
19	101	50.2		32.9	76	33.0	14.2	14	34.5	9.0	54.1
20	116	50.1		32.2	91	06.2	14.2	14	25.5	9.0	54.1
21	131	50.0	. .	31.6	105	39.4	14.3	14	16.5	9.0	54.1
22	146	49.9		30.9	120	12.7	14.3	14	07.5	9.2	54.1
23	161	49.7		30.3	134	46.0	14.3	13	58.3	9.1	54.1
27 00	176	49.6	S18	29.7	149	19.3	14.4	S13	49.2	9.3	54.1
01	191	49.5		29.0	163	52.7	14.3	13	39.9	9.3	54.2
02	206	49.3		28.4	178	26.0	14.5	13	30.6	9.3	54.2
03	221	49.2	. .	27.7	192	59.5	14.4	13	21.3	9.5	54.2
04	236	49.1		27.1	207	32.9	14.5	13	11.8	9.4	54.2
05	251	49.0		26.4	222	06.4	14.5	13	02.4	9.6	54.2
06	266	48.8	S18	25.8	236	39.9	14.5	S12	52.8	9.5	54.2
07	281	48.7		25.1	251	13.4	14.6	12	43.3	9.7	54.2
S 08	296	48.6		24.5	265	47.0	14.6	12	33.6	9.7	54.2
A 09	311	48.5	. .	23.8	280	20.6	14.6	12	23.9	9.7	54.2
B 10	326	48.3		23.2	294	54.2	14.7	12	14.2	9.8	54.2
11	341	48.2		22.5	309	27.9	14.7	12	04.4	9.9	54.2
A 12	356	48.1	S18	21.9	324	01.6	14.7	S11	54.5	9.9	54.3
D 13	11	48.0		21.2	338	35.3	14.7	11	44.6	9.9	54.3
O 14	26	47.8		20.6	353	09.0	14.7	11	34.7	10.0	54.3
15	41	47.7	. .	19.9	7	42.7	14.8	11	24.7	10.1	54.3
16	56	47.6		19.3	22	16.5	14.8	11	14.6	10.1	54.3
17	71	47.5		18.6	36	50.3	14.9	11	04.5	10.1	54.3
18	86	47.3	S18	18.0	51	24.2	14.8	S10	54.4	10.2	54.3
19	101	47.2		17.3	65	58.0	14.9	10	44.2	10.3	54.3
20	116	47.1		16.7	80	31.9	14.9	10	33.9	10.3	54.3
21	131	47.0	. .	16.0	95	05.8	14.9	10	23.6	10.3	54.4
22	146	46.9		15.4	109	39.7	14.9	10	13.3	10.4	54.4
23	161	46.7		14.7	124	13.6	15.0	S10	02.9	10.4	54.4
	SD	16.3	d	0.6	SD		14.7		14.7		14.8

Lat.	Crepúsculo Náutico	Crepúsculo Civil	Orto Sol	Orto Luna 25	Orto Luna 26	Orto Luna 27	Orto Luna 28
°	h m	h m	h m	h m	h m	h m	h m
N 72	07 30	09 05	11 37	▬	11 41	11 08	10 47
N 70	07 19	08 42	10 20	11 32	11 04	10 48	10 35
68	07 11	08 24	09 43	10 46	10 38	10 31	10 26
66	07 03	08 09	09 17	10 15	10 17	10 18	10 18
64	06 57	07 57	08 57	09 52	10 01	10 07	10 11
62	06 51	07 47	08 41	09 34	09 48	09 58	10 05
60	06 46	07 38	08 27	09 19	09 36	09 49	10 00
N 58	06 42	07 30	08 16	09 06	09 26	09 42	09 55
56	06 38	07 23	08 06	08 55	09 17	09 36	09 51
54	06 34	07 17	07 57	08 45	09 10	09 30	09 48
52	06 30	07 11	07 49	08 36	09 03	09 25	09 45
50	06 27	07 06	07 42	08 28	08 56	09 20	09 42
45	06 19	06 54	07 26	08 11	08 43	09 10	09 35
N 40	06 12	06 45	07 14	07 58	08 31	09 02	09 29
35	06 05	06 36	07 03	07 46	08 22	08 54	09 25
30	05 59	06 28	06 53	07 36	08 13	08 48	09 21
20	05 47	06 14	06 37	07 18	07 59	08 37	09 13
N 10	05 35	06 01	06 23	07 02	07 46	08 27	09 07
0	05 22	05 47	06 09	06 48	07 34	08 18	09 01
S 10	05 07	05 33	05 55	06 33	07 21	08 09	08 55
20	04 49	05 17	05 40	06 18	07 08	07 59	08 48
30	04 26	04 57	05 23	06 00	06 54	07 47	08 41
35	04 11	04 45	05 13	05 49	06 45	07 41	08 37
40	03 53	04 31	05 02	05 37	06 35	07 33	08 32
45	03 31	04 14	04 48	05 23	06 23	07 24	08 26
S 50	03 00	03 52	04 31	05 06	06 09	07 14	08 19
52	02 44	03 41	04 23	04 58	06 03	07 09	08 16
54	02 24	03 29	04 15	04 49	05 55	07 04	08 13
56	01 58	03 15	04 05	04 38	05 47	06 57	08 09
58	01 20	02 58	03 53	04 27	05 38	06 51	08 05
S 60	////	02 37	03 40	04 13	05 27	06 43	08 00

Lat.	Ocaso Sol	Crepúsculo Civil	Crepúsculo Náutico	Ocaso Luna 25	Ocaso Luna 26	Ocaso Luna 27	Ocaso Luna 28
°	h m	h m	h m	h m	h m	h m	h m
N 72	12 50	15 22	16 57	▬	16 04	18 08	19 59
N 70	14 06	15 45	17 07	14 37	16 40	18 27	20 09
68	14 43	16 03	17 16	15 23	17 05	18 42	20 16
66	15 09	16 17	17 23	15 53	17 24	18 54	20 23
64	15 29	16 29	17 29	16 15	17 39	19 04	20 28
62	15 45	16 39	17 35	16 33	17 52	19 12	20 33
60	15 59	16 48	17 40	16 48	18 03	19 20	20 37
N 58	16 10	16 56	17 44	17 00	18 12	19 26	20 40
56	16 20	17 03	17 48	17 11	18 21	19 32	20 43
54	16 29	17 09	17 52	17 20	18 28	19 37	20 46
52	16 37	17 15	17 56	17 28	18 34	19 41	20 49
50	16 44	17 20	17 59	17 36	18 40	19 45	20 51
45	16 59	17 31	18 07	17 52	18 53	19 54	20 56
N 40	17 12	17 41	18 14	18 05	19 03	20 01	21 00
35	17 23	17 50	18 20	18 16	19 12	20 08	21 04
30	17 32	17 57	18 26	18 26	19 20	20 13	21 07
20	17 48	18 12	18 38	18 42	19 33	20 23	21 12
N 10	18 03	18 25	18 50	18 57	19 44	20 31	21 17
0	18 16	18 38	19 03	19 10	19 55	20 39	21 21
S 10	18 30	18 52	19 18	19 24	20 06	20 46	21 26
20	18 44	19 08	19 36	19 38	20 17	20 54	21 30
30	19 01	19 28	19 59	19 54	20 30	21 04	21 35
35	19 11	19 39	20 13	20 03	20 37	21 09	21 38
40	19 23	19 53	20 31	20 14	20 46	21 15	21 42
45	19 36	20 10	20 53	20 26	20 56	21 22	21 46
S 50	19 53	20 32	21 24	20 42	21 08	21 30	21 50
52	20 01	20 42	21 40	20 49	21 13	21 34	21 52
54	20 09	20 54	21 59	20 56	21 19	21 38	21 55
56	20 19	21 08	22 23	21 05	21 26	21 42	21 57
58	20 30	21 25	22 59	21 15	21 33	21 48	22 00
S 60	20 43	21 45	////	21 26	21 42	21 53	22 03

Día	SOL E. T. (−) 00h	SOL E. T. (−) 12h	SOL Pas. Mer.	LUNA Pas. Mer. Sup.	LUNA Pas. Mer. Inf.	LUNA Edad	LUNA Fase
d	m s	m s	h m	h m	h m	d	%
25	12 15	12 22	12 12	12 59	00 36	01	1
26	12 29	12 35	12 13	13 44	01 22	02	3
27	12 41	12 47	12 13	14 28	02 06	03	8

T.U.	ARIES	VENUS −4.5		MARTE +1.0		JUPITER −2.5		SATURNO +0.1		ESTRELLAS		
	A.H.G.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.	Nombre	A.H.S.	Dec.
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′		° ′	° ′
28 00	127 19.4	132 29.1	S 1 12.1	259 05.0	S16 43.9	68 06.1	N19 43.0	75 05.7	N16 46.7	Acamar	315 25.6	S40 18.4
01	142 21.9	147 29.6	10.9	274 06.1	44.3	83 08.6	43.1	90 08.1	46.7	Achernar	335 34.0	S57 14.3
02	157 24.3	162 30.0	09.7	289 07.1	44.7	98 11.0	43.1	105 10.6	46.7	Acrux	173 19.9	S63 06.0
03	172 26.8	177 30.5 . .	08.5	304 08.2 . .	45.1	113 13.5 . .	43.1	120 13.0 . .	46.7	Adhara	255 19.8	S28 58.6
04	187 29.3	192 30.9	07.3	319 09.3	45.5	128 15.9	43.1	135 15.5	46.7	Aldebaran	291 00.3	N16 30.6
05	202 31.7	207 31.4	06.1	334 10.3	45.8	143 18.3	43.1	150 18.0	46.7			
06	217 34.2	222 31.8	S 1 04.9	349 11.4	S16 46.2	158 20.8	N19 43.1	165 20.4	N16 46.8	Alioth	166 28.9	N55 57.0
07	232 36.6	237 32.3	03.7	4 12.5	46.6	173 23.2	43.2	180 22.9	46.8	Alkaid	153 06.4	N49 18.3
D 08	247 39.1	252 32.8	02.5	19 13.6	47.0	188 25.7	43.2	195 25.3	46.8	Al Na'ir	27 56.3	S46 57.6
O 09	262 41.6	267 33.2 . .	01.3	34 14.6 . .	47.4	203 28.1 . .	43.2	210 27.8 . .	46.8	Alnilam	275 56.0	S 1 12.2
M 10	277 44.0	282 33.7	1 00.1	49 15.7	47.7	218 30.5	43.2	225 30.2	46.8	Alphard	218 05.3	S 8 39.8
I 11	292 46.5	297 34.1	0 58.9	64 16.8	48.1	233 33.0	43.2	240 32.7	46.8			
N 12	307 49.0	312 34.6	S 0 57.7	79 17.9	S16 48.5	248 35.4	N19 43.2	255 35.1	N16 46.9	Alphecca	126 19.3	N26 42.5
13	322 51.4	327 35.1	56.5	94 18.9	48.9	263 37.9	43.2	270 37.6	46.9	Alpheratz	357 53.8	N29 05.7
G 14	337 53.9	342 35.5	55.3	109 20.0	49.3	278 40.3	43.3	285 40.0	46.9	Altair	62 18.0	N 8 52.2
O 15	352 56.4	357 36.0 . .	54.1	124 21.1 . .	49.6	293 42.7 . .	43.3	300 42.5 . .	46.9	Ankaa	353 25.4	S42 18.4
16	7 58.8	12 36.5	52.9	139 22.1	50.0	308 45.2	43.3	315 44.9	46.9	Antares	112 38.4	S26 25.9
17	23 01.3	27 36.9	51.7	154 23.2	50.4	323 47.6	43.3	330 47.4	46.9			
18	38 03.8	42 37.4	S 0 50.5	169 24.3	S16 50.8	338 50.0	N19 43.3	345 49.8	N16 46.9	Arcturus	146 04.5	N19 10.5
19	53 06.2	57 37.9	49.3	184 25.4	51.2	353 52.5	43.3	0 52.3	47.0	Atria	107 49.3	S69 01.5
20	68 08.7	72 38.3	48.1	199 26.4	51.5	8 54.9	43.4	15 54.7	47.0	Avior	234 21.4	S59 30.8
21	83 11.1	87 38.8 . .	46.9	214 27.5 . .	51.9	23 57.3 . .	43.4	30 57.2 . .	47.0	Bellatrix	278 42.2	N 6 20.9
22	98 13.6	102 39.3	45.7	229 28.6	52.3	38 59.8	43.4	45 59.6	47.0	Betelgeuse	271 11.5	N 7 24.3
23	113 16.1	117 39.8	44.5	244 29.7	52.7	54 02.2	43.4	61 02.1	47.0			
29 00	128 18.5	132 40.2	S 0 43.3	259 30.7	S16 53.0	69 04.6	N19 43.4	76 04.5	N16 47.0	Canopus	264 00.0	S52 42.0
01	143 21.0	147 40.7	42.1	274 31.8	53.4	84 07.1	43.4	91 06.9	47.1	Capella	280 48.5	N46 00.0
02	158 23.5	162 41.2	41.0	289 32.9	53.8	99 09.5	43.5	106 09.4	47.1	Deneb	49 38.6	N45 17.0
03	173 25.9	177 41.7 . .	39.8	304 34.0 . .	54.2	114 11.9 . .	43.5	121 11.8 . .	47.1	Denebola	182 43.3	N14 33.9
04	188 28.4	192 42.2	38.6	319 35.0	54.5	129 14.4	43.5	136 14.3	47.1	Diphda	349 05.7	S17 59.1
05	203 30.9	207 42.6	37.4	334 36.1	54.9	144 16.8	43.5	151 16.7	47.1			
06	218 33.3	222 43.1	S 0 36.2	349 37.2	S16 55.3	159 19.2	N19 43.5	166 19.2	N16 47.1	Dubhe	194 02.9	N61 44.6
07	233 35.8	237 43.6	35.0	4 38.2	55.7	174 21.7	43.5	181 21.6	47.2	Elnath	278 24.6	N28 36.5
08	248 38.2	252 44.1	33.8	19 39.3	56.1	189 24.1	43.6	196 24.1	47.2	Eltanin	90 51.1	N51 29.2
L 09	263 40.7	267 44.6 . .	32.6	34 40.4 . .	56.4	204 26.5 . .	43.6	211 26.5 . .	47.2	Enif	33 57.0	N 9 52.7
U 10	278 43.2	282 45.1	31.4	49 41.5	56.8	219 29.0	43.6	226 29.0	47.2	Fomalhaut	15 34.9	S29 37.3
N 11	293 45.6	297 45.6	30.2	64 42.5	57.2	234 31.4	43.6	241 31.4	47.2			
E 12	308 48.1	312 46.0	S 0 29.0	79 43.6	S16 57.6	249 33.8	N19 43.6	256 33.9	N16 47.2	Gacrux	172 11.5	S57 06.8
13	323 50.6	327 46.5	27.8	94 44.7	57.9	264 36.3	43.6	271 36.3	47.3	Gienah	176 02.1	S17 32.8
S 14	338 53.0	342 47.0	26.6	109 45.8	58.3	279 38.7	43.7	286 38.8	47.3	Hadar	149 01.7	S60 22.3
15	353 55.5	357 47.5 . .	25.4	124 46.8 . .	58.7	294 41.1 . .	43.7	301 41.2 . .	47.3	Hamal	328 11.8	N23 28.0
16	8 58.0	12 48.0	24.2	139 47.9	59.0	309 43.5	43.7	316 43.6	47.3	Kaus Aust.	83 57.0	S34 23.0
17	24 00.4	27 48.5	23.0	154 49.0	59.4	324 46.0	43.7	331 46.1	47.3			
18	39 02.9	42 49.0	S 0 21.8	169 50.1	S16 59.8	339 48.4	N19 43.7	346 48.5	N16 47.3	Kochab	137 19.7	N74 08.8
19	54 05.4	57 49.5	20.6	184 51.1	17 00.2	354 50.8	43.7	1 51.0	47.4	Markab	13 48.3	N15 12.5
20	69 07.8	72 50.0	19.5	199 52.2	00.5	9 53.3	43.8	16 53.4	47.4	Menkar	314 25.1	N 4 05.5
21	84 10.3	87 50.5 . .	18.3	214 53.3 . .	00.9	24 55.7 . .	43.8	31 55.9 . .	47.4	Menkent	148 19.0	S36 22.3
22	99 12.7	102 51.0	17.1	229 54.4	01.3	39 58.1	43.8	46 58.3	47.4	Miaplacidus	221 40.9	S69 43.2
23	114 15.2	117 51.5	15.9	244 55.4	01.7	55 00.5	43.8	62 00.8	47.4			
30 00	129 17.7	132 52.0	S 0 14.7	259 56.5	S17 02.0	70 03.0	N19 43.8	77 03.2	N16 47.4	Mirfak	308 54.2	N49 52.0
01	144 20.1	147 52.5	13.5	274 57.6	02.4	85 05.4	43.9	92 05.6	47.5	Nunki	76 10.7	S26 17.7
02	159 22.6	162 53.0	12.3	289 58.7	02.8	100 07.8	43.9	107 08.1	47.5	Peacock	53 35.0	S56 44.0
03	174 25.1	177 53.5 . .	11.1	304 59.7 . .	03.1	115 10.2 . .	43.9	122 10.5 . .	47.5	Pollux	243 39.2	N28 01.4
04	189 27.5	192 54.0	09.9	320 00.8	03.5	130 12.7	43.9	137 13.0	47.5	Procyon	245 09.5	N 5 13.3
05	204 30.0	207 54.5	08.7	335 01.9	03.9	145 15.1	43.9	152 15.4	47.5			
06	219 32.5	222 55.1	S 0 07.5	350 03.0	S17 04.3	160 17.5	N19 43.9	167 17.9	N16 47.6	Rasalhague	96 15.7	N12 33.5
07	234 34.9	237 55.6	06.3	5 04.0	04.6	175 19.9	44.0	182 20.3	47.6	Regulus	207 53.5	N11 57.7
M 08	249 37.4	252 56.1	05.2	20 05.1	05.0	190 22.3	44.0	197 22.7	47.6	Rigel	281 21.2	S 8 12.2
A 09	264 39.8	267 56.6 . .	04.0	35 06.2 . .	05.4	205 24.8 . .	44.0	212 25.2 . .	47.6	Rigil Kent.	140 05.2	S60 50.0
R 10	279 42.3	282 57.1	02.8	50 07.3	05.7	220 27.2	44.0	227 27.6	47.6	Sabik	102 23.9	S15 43.5
T 11	294 44.8	297 57.6	01.6	65 08.3	06.1	235 29.6	44.0	242 30.1	47.6			
E 12	309 47.2	312 58.1	S 0 00.4	80 09.4	S17 06.5	250 32.0	N19 44.1	257 32.5	N16 47.7	Schedar	349 51.9	N56 32.7
13	324 49.7	327 58.7	N 00.8	95 10.5	06.9	265 34.4	44.1	272 34.9	47.7	Shaula	96 35.4	S37 06.2
S 14	339 52.2	342 59.2	02.0	110 11.6	07.2	280 36.9	44.1	287 37.4	47.7	Sirius	258 42.0	S16 43.2
15	354 54.6	357 59.7 . .	03.2	125 12.6 . .	07.6	295 39.3 . .	44.1	302 39.8 . .	47.7	Spica	158 41.4	S11 09.9
16	9 57.1	13 00.2	04.4	140 13.7	08.0	310 41.7	44.1	317 42.3	47.7	Suhail	222 59.1	S43 26.2
17	24 59.6	28 00.7	05.5	155 14.8	08.3	325 44.1	44.2	332 44.7	47.7			
18	40 02.0	43 01.3	N 0 06.7	170 15.9	S17 08.7	340 46.5	N19 44.2	347 47.1	N16 47.8	Vega	80 45.9	N38 46.9
19	55 04.5	58 01.8	07.9	185 17.0	09.1	355 49.0	44.2	2 49.6	47.8	Zuben'ubi	137 16.2	S16 02.7
20	70 07.0	73 02.3	09.1	200 18.0	09.4	10 51.4	44.2	17 52.0	47.8		A.H.S.	Pas. Mer.
21	85 09.4	88 02.8 . .	10.3	215 19.1 . .	09.8	25 53.8 . .	44.2	32 54.5 . .	47.8		° ′	h m
22	100 11.9	103 03.4	11.5	230 20.2	10.2	40 56.2	44.3	47 56.9	47.8	Venus	4 21.7	15 09
23	115 14.3	118 03.9	12.7	245 21.3	10.5	55 58.6	44.3	62 59.3	47.9	Marte	131 12.2	6 41
	h m									Júpiter	300 46.1	19 21
Pas. Mer.	15 24.2	*v* 0.5	*d* 1.2	*v* 1.1	*d* 0.4	*v* 2.4	*d* 0.0	*v* 2.4	*d* 0.0	Saturno	307 46.0	18 53

T.U.	SOL				LUNA					
	A.H.G.		Dec.		A.H.G.	v	Dec.	d	P.H.	
d h	° ′		° ′		° ′	′	° ′	′	′	
28 00	176 46.6		S18 14.0		138 47.6	15.0	S 9 52.5	10.5	54.4	
01	191 46.5		13.4		153 21.6	15.0	9 42.0	10.5	54.4	
02	206 46.4		12.7		167 55.6	15.0	9 31.5	10.6	54.4	
03	221 46.3	. .	12.1		182 29.6	15.0	9 20.9	10.6	54.4	
04	236 46.1		11.4		197 03.6	15.0	9 10.3	10.6	54.4	
05	251 46.0		10.8		211 37.6	15.1	8 59.7	10.7	54.5	
06	266 45.9		S18 10.1		226 11.7	15.1	S 8 49.0	10.8	54.5	
07	281 45.8		09.4		240 45.8	15.1	8 38.2	10.7	54.5	
08	296 45.7		08.8		255 19.9	15.1	8 27.5	10.8	54.5	
D 09	311 45.6	. .	08.1		269 54.0	15.1	8 16.7	10.9	54.5	
O 10	326 45.4		07.5		284 28.1	15.2	8 05.8	10.8	54.5	
M 11	341 45.3		06.8		299 02.3	15.1	7 55.0	11.0	54.5	
I 12	356 45.2		S18 06.1		313 36.4	15.2	S 7 44.0	10.9	54.6	
N 13	11 45.1		05.5		328 10.6	15.1	7 33.1	11.0	54.6	
G 14	26 45.0		04.8		342 44.7	15.2	7 22.1	11.0	54.6	
O 15	41 44.9	. .	04.1		357 18.9	15.2	7 11.1	11.1	54.6	
16	56 44.7		03.5		11 53.1	15.2	7 00.0	11.1	54.6	
17	71 44.6		02.8		26 27.3	15.2	6 48.9	11.1	54.6	
18	86 44.5		S18 02.1		41 01.5	15.2	S 6 37.8	11.2	54.7	
19	101 44.4		01.5		55 35.7	15.2	6 26.6	11.1	54.7	
20	116 44.3		00.8		70 09.9	15.3	6 15.5	11.3	54.7	
21	131 44.2		18 00.1		84 44.2	15.2	6 04.2	11.2	54.7	
22	146 44.1		17 59.5		99 18.4	15.2	5 53.0	11.3	54.7	
23	161 44.0		58.8		113 52.6	15.3	5 41.7	11.3	54.7	
29 00	176 43.8		S17 58.1		128 26.9	15.2	S 5 30.4	11.3	54.8	
01	191 43.7		57.5		143 01.1	15.2	5 19.1	11.4	54.8	
02	206 43.6		56.8		157 35.3	15.3	5 07.7	11.4	54.8	
03	221 43.5	. .	56.1		172 09.6	15.2	4 56.3	11.4	54.8	
04	236 43.4		55.4		186 43.8	15.3	4 44.9	11.4	54.8	
05	251 43.3		54.8		201 18.1	15.2	4 33.5	11.5	54.8	
06	266 43.2		S17 54.1		215 52.3	15.3	S 4 22.0	11.5	54.9	
07	281 43.1		53.4		230 26.6	15.2	4 10.5	11.5	54.9	
L 08	296 43.0		52.7		245 00.8	15.2	3 59.0	11.6	54.9	
U 09	311 42.9	. .	52.1		259 35.0	15.2	3 47.4	11.5	54.9	
N 10	326 42.7		51.4		274 09.2	15.3	3 35.9	11.6	54.9	
11	341 42.6		50.7		288 43.5	15.2	3 24.3	11.6	55.0	
E 12	356 42.5		S17 50.0		303 17.7	15.2	S 3 12.7	11.7	55.0	
13	11 42.4		49.4		317 51.9	15.2	3 01.0	11.6	55.0	
S 14	26 42.3		48.7		332 26.1	15.2	2 49.4	11.7	55.0	
15	41 42.2	. .	48.0		347 00.3	15.2	2 37.7	11.6	55.0	
16	56 42.1		47.3		1 34.5	15.1	2 26.1	11.8	55.1	
17	71 42.0		46.6		16 08.6	15.2	2 14.3	11.7	55.1	
18	86 41.9		S17 46.0		30 42.8	15.1	S 2 02.6	11.7	55.1	
19	101 41.8		45.3		45 16.9	15.2	1 50.9	11.8	55.1	
20	116 41.7		44.6		59 51.1	15.1	1 39.1	11.7	55.2	
21	131 41.6	. .	43.9		74 25.2	15.1	1 27.4	11.8	55.2	
22	146 41.5		43.2		88 59.3	15.0	1 15.6	11.8	55.2	
23	161 41.4		42.6		103 33.3	15.1	1 03.8	11.8	55.2	
30 00	176 41.3		S17 41.9		118 07.4	15.1	S 0 52.0	11.8	55.2	
01	191 41.2		41.2		132 41.5	15.0	0 40.2	11.9	55.3	
02	206 41.1		40.5		147 15.5	15.0	0 28.3	11.8	55.3	
03	221 41.0	. .	39.8		161 49.5	15.0	0 16.5	11.9	55.3	
04	236 40.9		39.1		176 23.5	15.0	S 0 04.6	11.8	55.3	
05	251 40.8		38.4		190 57.5	14.9	N 0 07.2	11.9	55.4	
06	266 40.7		S17 37.8		205 31.4	14.9	N 0 19.1	11.9	55.4	
07	281 40.6		37.1		220 05.3	14.9	0 31.0	11.9	55.4	
M 08	296 40.5		36.4		234 39.2	14.9	0 42.9	11.9	55.4	
A 09	311 40.4	. .	35.7		249 13.1	14.8	0 54.8	11.9	55.5	
R 10	326 40.3		35.0		263 46.9	14.8	1 06.7	11.9	55.5	
T 11	341 40.2		34.3		278 20.7	14.8	1 18.6	11.9	55.5	
E 12	356 40.1		S17 33.6		292 54.5	14.8	N 1 30.5	11.9	55.5	
13	11 40.0		32.9		307 28.3	14.7	1 42.4	11.9	55.6	
S 14	26 39.9		32.2		322 02.0	14.7	1 54.3	11.9	55.6	
15	41 39.8	. .	31.6		336 35.7	14.7	2 06.2	12.0	55.6	
16	56 39.7		30.9		351 09.4	14.6	2 18.2	11.9	55.6	
17	71 39.6		30.2		5 43.0	14.6	2 30.1	11.9	55.7	
18	86 39.5		S17 29.5		20 16.6	14.6	N 2 42.0	11.9	55.7	
19	101 39.4		28.8		34 50.2	14.5	2 53.9	12.0	55.7	
20	116 39.3		28.1		49 23.7	14.5	3 05.9	11.9	55.7	
21	131 39.2	. .	27.4		63 57.2	14.4	3 17.8	11.9	55.8	
22	146 39.1		26.7		78 30.6	14.4	3 29.7	11.9	55.8	
23	161 39.0		26.0		93 04.0	14.4	N 3 41.6	11.9	55.8	
	SD 16.3		d 0.7		SD	14.9	15.0		15.1	

Lat.	Crepúsculo Náutico	Crepúsculo Civil	Orto Sol	Orto Luna 28	Orto Luna 29	Orto Luna 30	Orto Luna 31
°	h m	h m	h m	h m	h m	h m	h m
N 72	07 20	08 51	10 54	10 47	10 29	10 12	09 55
N 70	07 11	08 31	10 02	10 35	10 24	10 14	10 03
68	07 03	08 14	09 30	10 26	10 20	10 15	10 10
66	06 56	08 01	09 07	10 18	10 17	10 16	10 15
64	06 51	07 50	08 48	10 11	10 14	10 17	10 20
62	06 46	07 41	08 33	10 05	10 11	10 17	10 24
60	06 41	07 32	08 21	10 00	10 09	10 18	10 28
N 58	06 37	07 25	08 10	09 55	10 07	10 19	10 31
56	06 33	07 19	08 00	09 51	10 06	10 19	10 34
54	06 30	07 13	07 52	09 48	10 04	10 20	10 36
52	06 27	07 07	07 44	09 45	10 03	10 20	10 38
50	06 23	07 03	07 38	09 42	10 01	10 21	10 41
45	06 16	06 52	07 23	09 35	09 58	10 21	10 45
N 40	06 10	06 42	07 11	09 29	09 56	10 22	10 49
35	06 04	06 34	07 01	09 25	09 54	10 23	10 53
30	05 58	06 27	06 52	09 21	09 52	10 23	10 56
20	05 47	06 13	06 36	09 13	09 49	10 24	11 01
N 10	05 35	06 01	06 23	09 07	09 46	10 25	11 06
0	05 23	05 48	06 10	09 01	09 43	10 26	11 10
S 10	05 08	05 34	05 56	08 55	09 41	10 27	11 14
20	04 51	05 19	05 42	08 48	09 38	10 28	11 19
30	04 29	05 00	05 26	08 41	09 35	10 29	11 25
35	04 15	04 49	05 16	08 37	09 33	10 30	11 28
40	03 58	04 35	05 05	08 32	09 31	10 30	11 32
45	03 36	04 19	04 52	08 26	09 28	10 31	11 36
S 50	03 07	03 58	04 37	08 19	09 25	10 32	11 41
52	02 52	03 48	04 29	08 16	09 24	10 33	11 43
54	02 34	03 36	04 21	08 13	09 22	10 33	11 46
56	02 11	03 23	04 11	08 09	09 21	10 34	11 49
58	01 39	03 07	04 01	08 05	09 19	10 35	11 52
S 60	00 25	02 48	03 48	08 00	09 17	10 35	11 56

Lat.	Ocaso Sol	Crepúsculo Civil	Crepúsculo Náutico	Ocaso Luna 28	Ocaso Luna 29	Ocaso Luna 30	Ocaso Luna 31
°	h m	h m	h m	h m	h m	h m	h m
N 72	13 33	15 36	17 08	19 59	21 46	23 35	25 29
N 70	14 26	15 57	17 17	20 09	21 48	23 29	25 15
68	14 57	16 13	17 25	20 16	21 50	23 25	25 04
66	15 21	16 26	17 31	20 23	21 51	23 21	24 55
64	15 39	16 37	17 37	20 28	21 52	23 18	24 47
62	15 54	16 47	17 42	20 33	21 53	23 16	24 40
60	16 06	16 55	17 46	20 37	21 54	23 13	24 35
N 58	16 17	17 02	17 50	20 40	21 55	23 11	24 30
56	16 27	17 08	17 54	20 43	21 56	23 09	24 25
54	16 35	17 14	17 57	20 46	21 56	23 08	24 21
52	16 42	17 20	18 00	20 49	21 57	23 06	24 18
50	16 49	17 24	18 04	20 51	21 57	23 05	24 15
45	17 04	17 35	18 11	20 56	21 58	23 02	24 08
N 40	17 16	17 44	18 17	21 00	21 59	23 00	24 02
35	17 26	17 52	18 23	21 04	22 00	22 57	23 57
30	17 35	18 00	18 29	21 07	22 01	22 56	23 52
20	17 50	18 13	18 40	21 12	22 02	22 52	23 45
N 10	18 04	18 26	18 51	21 17	22 03	22 50	23 38
0	18 17	18 38	19 04	21 21	22 04	22 47	23 32
S 10	18 30	18 52	19 18	21 26	22 05	22 44	23 26
20	18 44	19 07	19 35	21 30	22 06	22 41	23 19
30	19 00	19 26	19 57	21 35	22 07	22 38	23 11
35	19 09	19 37	20 11	21 38	22 07	22 36	23 07
40	19 20	19 50	20 28	21 42	22 08	22 34	23 02
45	19 33	20 07	20 49	21 46	22 09	22 32	22 57
S 50	19 49	20 27	21 18	21 50	22 10	22 29	22 50
52	19 56	20 37	21 32	21 52	22 10	22 28	22 47
54	20 04	20 49	21 50	21 55	22 10	22 26	22 43
56	20 14	21 02	22 12	21 57	22 11	22 25	22 40
58	20 24	21 17	22 43	22 00	22 11	22 23	22 35
S 60	20 36	21 36	00 02	22 03	22 12	22 21	22 31

Día	SOL E. T. (−) 00h	SOL E. T. (−) 12h	SOL Pas. Mer.	LUNA Pas. Mer. Sup.	LUNA Pas. Mer. Inf.	LUNA Edad	LUNA Fase
d	m s	m s	h m	h m	h m	d	%
28	12 53	12 59	12 13	15 11	02 50	04	14
29	13 04	13 10	12 13	15 54	03 32	05	21
30	13 15	13 20	12 13	16 36	04 15	06	29

(MIE., JUE., VIE.) 31 ENERO 1, 2 FEBRERO DEL 2001

T.U.	ARIES	VENUS −4.5		MARTE +1.0		JUPITER −2.5		SATURNO +0.1	
d h	A.H.G.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.
	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
31 00	130 16.8	133 04.4	N 0 13.9	260 22.3	S17 10.9	71 01.0	N19 44.3	78 01.8	N16 47.9
01	145 19.3	148 05.0	15.0	275 23.4	11.3	86 03.5	44.3	93 04.2	47.9
02	160 21.7	163 05.5	16.2	290 24.5	11.6	101 05.9	44.3	108 06.7	47.9
03	175 24.2	178 06.0	. . 17.4	305 25.6	. . 12.0	116 08.3	. . 44.4	123 09.1	. . 47.9
04	190 26.7	193 06.6	18.6	320 26.6	12.4	131 10.7	44.4	138 11.5	48.0
05	205 29.1	208 07.1	19.8	335 27.7	12.7	146 13.1	44.4	153 14.0	48.0
06	220 31.6	223 07.7	N 0 21.0	350 28.8	S17 13.1	161 15.5	N19 44.4	168 16.4	N16 48.0
M 07	235 34.1	238 08.2	22.2	5 29.9	13.5	176 17.9	44.4	183 18.8	48.0
I 08	250 36.5	253 08.7	23.3	20 31.0	13.8	191 20.4	44.5	198 21.3	48.0
E 09	265 39.0	268 09.3	. . 24.5	35 32.0	. . 14.2	206 22.8	. . 44.5	213 23.7	. . 48.0
R 10	280 41.5	283 09.8	25.7	50 33.1	14.6	221 25.2	44.5	228 26.2	48.1
C 11	295 43.9	298 10.4	26.9	65 34.2	14.9	236 27.6	44.5	243 28.6	48.1
O 12	310 46.4	313 10.9	N 0 28.1	80 35.3	S17 15.3	251 30.0	N19 44.5	258 31.0	N16 48.1
L 13	325 48.8	328 11.5	29.3	95 36.3	15.7	266 32.4	44.6	273 33.5	48.1
E 14	340 51.3	343 12.0	30.4	110 37.4	16.0	281 34.8	44.6	288 35.9	48.1
S 15	355 53.8	358 12.6	. . 31.6	125 38.5	. . 16.4	296 37.2	. . 44.6	303 38.3	. . 48.2
16	10 56.2	13 13.1	32.8	140 39.6	16.8	311 39.7	44.6	318 40.8	48.2
17	25 58.7	28 13.7	34.0	155 40.7	17.1	326 42.1	44.6	333 43.2	48.2
18	41 01.2	43 14.2	N 0 35.2	170 41.7	S17 17.5	341 44.5	N19 44.7	348 45.6	N16 48.2
19	56 03.6	58 14.8	36.4	185 42.8	17.9	356 46.9	44.7	3 48.1	48.2
20	71 06.1	73 15.3	37.5	200 43.9	18.2	11 49.3	44.7	18 50.5	48.3
21	86 08.6	88 15.9	. . 38.7	215 45.0	. . 18.6	26 51.7	. . 44.7	33 52.9	. . 48.3
22	101 11.0	103 16.4	39.9	230 46.0	18.9	41 54.1	44.8	48 55.4	48.3
23	116 13.5	118 17.0	41.1	245 47.1	19.3	56 56.5	44.8	63 57.8	48.3
1 00	131 15.9	133 17.6	N 0 42.3	260 48.2	S17 19.7	71 58.9	N19 44.8	79 00.2	N16 48.3
01	146 18.4	148 18.1	43.4	275 49.3	20.0	87 01.3	44.8	94 02.7	48.4
02	161 20.9	163 18.7	44.6	290 50.4	20.4	102 03.7	44.8	109 05.1	48.4
03	176 23.3	178 19.2	. . 45.8	305 51.4	. . 20.8	117 06.1	. . 44.9	124 07.5	. . 48.4
04	191 25.8	193 19.8	47.0	320 52.5	21.1	132 08.5	44.9	139 10.0	48.4
05	206 28.3	208 20.4	48.2	335 53.6	21.5	147 11.0	44.9	154 12.4	48.4
06	221 30.7	223 20.9	N 0 49.3	350 54.7	S17 21.8	162 13.4	N19 44.9	169 14.8	N16 48.5
07	236 33.2	238 21.5	50.5	5 55.8	22.2	177 15.8	44.9	184 17.3	48.5
J 08	251 35.7	253 22.1	51.7	20 56.8	22.6	192 18.2	45.0	199 19.7	48.5
U 09	266 38.1	268 22.6	. . 52.9	35 57.9	. . 22.9	207 20.6	. . 45.0	214 22.1	. . 48.5
E 10	281 40.6	283 23.2	54.1	50 59.0	23.3	222 23.0	45.0	229 24.6	48.5
V 11	296 43.1	298 23.8	55.2	66 00.1	23.7	237 25.4	45.0	244 27.0	48.6
E 12	311 45.5	313 24.4	N 0 56.4	81 01.2	S17 24.0	252 27.8	N19 45.1	259 29.4	N16 48.6
S 13	326 48.0	328 24.9	57.6	96 02.2	24.4	267 30.2	45.1	274 31.9	48.6
14	341 50.4	343 25.5	58.8	111 03.3	24.7	282 32.6	45.1	289 34.3	48.6
15	356 52.9	358 26.1	0 59.9	126 04.4	. . 25.1	297 35.0	. . 45.1	304 36.7	. . 48.6
16	11 55.4	13 26.7	1 01.1	141 05.5	25.5	312 37.4	45.2	319 39.2	48.7
17	26 57.8	28 27.3	02.3	156 06.6	25.8	327 39.8	45.2	334 41.6	48.7
18	42 00.3	43 27.8	N 1 03.5	171 07.6	S17 26.2	342 42.2	N19 45.2	349 44.0	N16 48.7
19	57 02.8	58 28.4	04.6	186 08.7	26.5	357 44.6	45.2	4 46.4	48.7
20	72 05.2	73 29.0	05.8	201 09.8	26.9	12 47.0	45.2	19 48.9	48.7
21	87 07.7	88 29.6	. . 07.0	216 10.9	. . 27.3	27 49.4	. . 45.3	34 51.3	. . 48.8
22	102 10.2	103 30.2	08.2	231 12.0	27.6	42 51.8	45.3	49 53.7	48.8
23	117 12.6	118 30.8	09.3	246 13.0	28.0	57 54.2	45.3	64 56.2	48.8
2 00	132 15.1	133 31.4	N 1 10.5	261 14.1	S17 28.3	72 56.6	N19 45.3	79 58.6	N16 48.8
01	147 17.6	148 32.0	11.7	276 15.2	28.7	87 59.0	45.4	95 01.0	48.8
02	162 20.0	163 32.5	12.9	291 16.3	29.0	103 01.4	45.4	110 03.5	48.9
03	177 22.5	178 33.1	. . 14.0	306 17.4	. . 29.4	118 03.8	. . 45.4	125 05.9	. . 48.9
04	192 24.9	193 33.7	15.2	321 18.4	29.8	133 06.2	45.4	140 08.3	48.9
05	207 27.4	208 34.3	16.4	336 19.5	30.1	148 08.6	45.5	155 10.7	48.9
06	222 29.9	223 34.9	N 1 17.6	351 20.6	S17 30.5	163 11.0	N19 45.5	170 13.2	N16 48.9
07	237 32.3	238 35.5	18.7	6 21.7	30.8	178 13.4	45.5	185 15.6	49.0
08	252 34.8	253 36.1	19.9	21 22.8	31.2	193 15.8	45.5	200 18.0	49.0
V 09	267 37.3	268 36.7	. . 21.1	36 23.8	. . 31.5	208 18.2	. . 45.5	215 20.4	. . 49.0
I 10	282 39.7	283 37.3	22.2	51 24.9	31.9	223 20.6	45.6	230 22.9	49.0
E 11	297 42.2	298 37.9	23.4	66 26.0	32.3	238 22.9	45.6	245 25.3	49.1
R 12	312 44.7	313 38.5	N 1 24.6	81 27.1	S17 32.6	253 25.3	N19 45.6	260 27.7	N16 49.1
N 13	327 47.1	328 39.1	25.8	96 28.2	33.0	268 27.7	45.6	275 30.2	49.1
E 14	342 49.6	343 39.8	26.9	111 29.3	33.3	283 30.1	45.7	290 32.6	49.1
S 15	357 52.0	358 40.4	. . 28.1	126 30.3	. . 33.7	298 32.5	. . 45.7	305 35.0	. . 49.1
16	12 54.5	13 41.0	29.3	141 31.4	34.0	313 34.9	45.7	320 37.4	49.2
17	27 57.0	28 41.6	30.4	156 32.5	34.4	328 37.3	45.7	335 39.9	49.2
18	42 59.4	43 42.2	N 1 31.6	171 33.6	S17 34.7	343 39.7	N19 45.8	350 42.3	N16 49.2
19	58 01.9	58 42.8	32.8	186 34.7	35.1	358 42.1	45.8	5 44.7	49.2
20	73 04.4	73 43.4	33.9	201 35.7	35.5	13 44.5	45.8	20 47.1	49.2
21	88 06.8	88 44.0	. . 35.1	216 36.8	. . 35.8	28 46.9	. . 45.8	35 49.6	. . 49.3
22	103 09.3	103 44.7	36.3	231 37.9	36.2	43 49.3	45.9	50 52.0	49.3
23	118 11.8	118 45.3	37.4	246 39.0	36.5	58 51.7	45.9	65 54.4	49.3
Pas. Mer.	h m 15 12.4	*v* 0.6	*d* 1.2	*v* 1.1	*d* 0.4	*v* 2.4	*d* 0.0	*v* 2.4	*d* 0.0

ESTRELLAS

Nombre	A.H.S. ° ′	Dec. ° ′
Acamar	315 25.6	S40 18.4
Achernar	335 34.1	S57 14.3
Acrux	173 19.9	S63 06.0
Adhara	255 19.8	S28 58.6
Aldebaran	291 00.3	N16 30.6
Alioth	166 28.8	N55 57.0
Alkaid	153 06.4	N49 18.3
Al Na'ir	27 56.3	S46 57.6
Alnilam	275 56.0	S 1 12.2
Alphard	218 05.3	S 8 39.8
Alphecca	126 19.3	N26 42.5
Alpheratz	357 53.8	N29 05.7
Altair	62 18.0	N 8 52.2
Ankaa	353 25.4	S42 18.4
Antares	112 38.3	S26 25.9
Arcturus	146 04.5	N19 10.5
Atria	107 49.3	S69 01.5
Avior	234 21.4	S59 30.8
Bellatrix	278 42.2	N 6 20.9
Betelgeuse	271 11.5	N 7 24.3
Canopus	264 00.0	S52 42.0
Capella	280 48.5	N46 00.0
Deneb	49 38.6	N45 17.0
Denebola	182 43.3	N14 33.9
Diphda	349 05.8	S17 59.1
Dubhe	194 02.9	N61 44.6
Elnath	278 24.6	N28 36.5
Eltanin	90 51.0	N51 29.1
Enif	33 57.0	N 9 52.7
Fomalhaut	15 34.9	S29 37.3
Gacrux	172 11.5	S57 06.9
Gienah	176 02.1	S17 32.8
Hadar	149 01.7	S60 22.3
Hamal	328 11.8	N23 28.0
Kaus Aust.	83 57.0	S34 23.0
Kochab	137 19.6	N74 08.8
Markab	13 48.3	N15 12.5
Menkar	314 25.2	N 4 05.5
Menkent	148 19.0	S36 22.3
Miaplacidus	221 40.9	S69 43.2
Mirfak	308 54.2	N49 52.0
Nunki	76 10.6	S26 17.7
Peacock	53 35.0	S56 44.0
Pollux	243 39.2	N28 01.4
Procyon	245 09.5	N 5 13.3
Rasalhague	96 15.7	N12 33.5
Regulus	207 53.5	N11 57.7
Rigel	281 21.2	S 8 12.2
Rigil Kent.	140 05.1	S60 50.0
Sabik	102 23.9	S15 43.5
Schedar	349 52.0	N56 32.7
Shaula	96 35.4	S37 06.2
Sirius	258 42.0	S16 43.2
Spica	158 41.4	S11 09.9
Suhail	222 59.1	S43 26.2
Vega	80 45.9	N38 46.9
Zuben'ubi	137 16.2	S16 02.7

	A.H.S. ° ′	Pas. Mer. h m
Venus	2 01.6	15 06
Marte	129 32.3	6 36
Júpiter	300 43.0	19 09
Saturno	307 44.3	18 41

T.U.	SOL				LUNA						
	A.H.G.		Dec.		A.H.G.	v	Dec.	d	P.H.		
d h	° ′		° ′		° ′	′	° ′	′	′		
31 00	176 38.9		S17 25.3		107 37.4	14.3	N 3 53.5	11.9	55.8		
01	191 38.8		24.6		122 10.7	14.3	4 05.4	11.9	55.9		
02	206 38.7		23.9		136 44.0	14.2	4 17.3	11.9	55.9		
03	221 38.6	. .	23.2		151 17.2	14.2	4 29.2	11.9	55.9		
04	236 38.5		22.5		165 50.4	14.2	4 41.1	11.9	56.0		
05	251 38.4		21.8		180 23.6	14.1	4 53.0	11.8	56.0		
06	266 38.4		S17 21.1		194 56.7	14.0	N 5 04.8	11.9	56.0		
M 07	281 38.3		20.4		209 29.7	14.1	5 16.7	11.8	56.1		
I 08	296 38.2		19.7		224 02.8	13.9	5 28.5	11.9	56.1		
E 09	311 38.1	. .	19.0		238 35.7	13.9	5 40.4	11.8	56.1		
R 10	326 38.0		18.3		253 08.6	13.9	5 52.2	11.8	56.1		
C 11	341 37.9		17.6		267 41.5	13.8	6 04.0	11.8	56.2		
O 12	356 37.8		S17 16.9		282 14.3	13.7	N 6 15.8	11.7	56.2		
L 13	11 37.7		16.2		296 47.0	13.7	6 27.5	11.8	56.2		
E 14	26 37.6		15.5		311 19.7	13.7	6 39.3	11.7	56.3		
S 15	41 37.5	. .	14.8		325 52.4	13.6	6 51.0	11.8	56.3		
16	56 37.5		14.1		340 25.0	13.5	7 02.8	11.7	56.3		
17	71 37.4		13.4		354 57.5	13.5	7 14.5	11.7	56.4		
18	86 37.3		S17 12.7		9 30.0	13.4	N 7 26.2	11.6	56.4		
19	101 37.2		12.0		24 02.4	13.3	7 37.8	11.7	56.4		
20	116 37.1		11.3		38 34.7	13.3	7 49.5	11.6	56.5		
21	131 37.0	. .	10.6		53 07.0	13.2	8 01.1	11.6	56.5		
22	146 36.9		09.8		67 39.2	13.2	8 12.7	11.5	56.5		
23	161 36.8		09.1		82 11.4	13.1	8 24.2	11.6	56.5		
1 00	176 36.8		S17 08.4		96 43.5	13.0	N 8 35.8	11.5	56.6		
01	191 36.7		07.7		111 15.5	13.0	8 47.3	11.5	56.6		
02	206 36.6		07.0		125 47.5	12.9	8 58.8	11.5	56.6		
03	221 36.5	. .	06.3		140 19.4	12.8	9 10.3	11.4	56.7		
04	236 36.4		05.6		154 51.2	12.8	9 21.7	11.4	56.7		
05	251 36.3		04.9		169 23.0	12.7	9 33.1	11.4	56.7		
06	266 36.3		S17 04.2		183 54.7	12.6	N 9 44.5	11.3	56.8		
07	281 36.2		03.5		198 26.3	12.5	9 55.8	11.3	56.8		
J 08	296 36.1		02.7		212 57.8	12.5	10 07.1	11.3	56.9		
U 09	311 36.0	. .	02.0		227 29.3	12.4	10 18.4	11.2	56.9		
E 10	326 35.9		01.3		242 00.7	12.3	10 29.6	11.2	56.9		
V 11	341 35.8		17 00.6		256 32.0	12.2	10 40.8	11.2	57.0		
E 12	356 35.8		S16 59.9		271 03.2	12.2	N10 52.0	11.1	57.0		
S 13	11 35.7		59.2		285 34.4	12.1	11 03.1	11.1	57.0		
14	26 35.6		58.4		300 05.5	12.0	11 14.2	11.0	57.1		
15	41 35.5	. .	57.7		314 36.5	11.9	11 25.2	11.0	57.1		
16	56 35.4		57.0		329 07.4	11.9	11 36.2	11.0	57.1		
17	71 35.4		56.3		343 38.3	11.8	11 47.2	10.9	57.2		
18	86 35.3		S16 55.6		358 09.1	11.6	N11 58.1	10.9	57.2		
19	101 35.2		54.9		12 39.7	11.6	12 09.0	10.8	57.2		
20	116 35.1		54.1		27 10.3	11.6	12 19.8	10.7	57.3		
21	131 35.0	. .	53.4		41 40.9	11.4	12 30.5	10.8	57.3		
22	146 35.0		52.7		56 11.3	11.3	12 41.3	10.6	57.3		
23	161 34.9		52.0		70 41.6	11.3	12 51.9	10.6	57.4		
2 00	176 34.8		S16 51.3		85 11.9	11.2	N13 02.5	10.6	57.4		
01	191 34.7		50.5		99 42.1	11.0	13 13.1	10.5	57.5		
02	206 34.7		49.8		114 12.1	11.0	13 23.6	10.5	57.5		
03	221 34.6	. .	49.1		128 42.1	10.9	13 34.1	10.4	57.5		
04	236 34.5		48.4		143 12.0	10.8	13 44.5	10.3	57.6		
05	251 34.4		47.6		157 41.8	10.8	13 54.8	10.3	57.6		
06	266 34.4		S16 46.9		172 11.6	10.6	N14 05.1	10.2	57.6		
07	281 34.3		46.2		186 41.2	10.5	14 15.3	10.2	57.7		
08	296 34.2		45.5		201 10.7	10.5	14 25.5	10.1	57.7		
V 09	311 34.1	. .	44.7		215 40.2	10.3	14 35.6	10.0	57.8		
I 10	326 34.1		44.0		230 09.5	10.3	14 45.6	10.0	57.8		
E 11	341 34.0		43.3		244 38.8	10.1	14 55.6	9.9	57.8		
R 12	356 33.9		S16 42.6		259 07.9	10.1	N15 05.5	9.8	57.9		
N 13	11 33.9		41.8		273 37.0	9.9	15 15.3	9.8	57.9		
E 14	26 33.8		41.1		288 05.9	9.9	15 25.1	9.7	57.9		
S 15	41 33.7	. .	40.4		302 34.8	9.7	15 34.8	9.6	58.0		
16	56 33.6		39.6		317 03.5	9.7	15 44.4	9.6	58.0		
17	71 33.6		38.9		331 32.2	9.6	15 54.0	9.4	58.1		
18	86 33.5		S16 38.2		346 00.8	9.4	N16 03.4	9.4	58.1		
19	101 33.4		37.4		0 29.2	9.4	16 12.8	9.3	58.1		
20	116 33.4		36.7		14 57.6	9.3	16 22.1	9.3	58.2		
21	131 33.3	. .	36.0		29 25.9	9.1	16 31.4	9.1	58.2		
22	146 33.2		35.3		43 54.0	9.1	16 40.5	9.1	58.3		
23	161 33.2		34.5		58 22.1	8.9	N16 49.6	9.0	58.3		
	SD 16.3		d 0.7		SD 15.3		15.5		15.8		

Lat.	Crepúsculo Náutico	Crepúsculo Civil	Orto Sol	Orto Luna 31	Orto Luna 1	Orto Luna 2	Orto Luna 3
°	h m	h m	h m	h m	h m	h m	h m
N 72	07 09	08 38	10 26	09 55	09 35	09 07	07 44
N 70	07 01	08 20	09 45	10 03	09 51	09 36	09 12
68	06 55	08 05	09 17	10 10	10 04	09 58	09 52
66	06 49	07 53	08 56	10 15	10 15	10 16	10 19
64	06 44	07 43	08 39	10 20	10 24	10 30	10 41
62	06 40	07 34	08 25	10 24	10 32	10 42	10 58
60	06 36	07 26	08 14	10 28	10 38	10 53	11 12
N 58	06 32	07 20	08 04	10 31	10 44	11 02	11 25
56	06 29	07 14	07 55	10 34	10 50	11 10	11 35
54	06 26	07 08	07 47	10 36	10 54	11 17	11 45
52	06 23	07 03	07 40	10 38	10 59	11 23	11 53
50	06 20	06 59	07 34	10 41	11 03	11 29	12 01
45	06 13	06 49	07 20	10 45	11 11	11 41	12 17
N 40	06 08	06 40	07 09	10 49	11 18	11 52	12 31
35	06 02	06 32	06 59	10 53	11 25	12 01	12 42
30	05 57	06 25	06 50	10 56	11 30	12 09	12 52
20	05 46	06 13	06 36	11 01	11 40	12 22	13 10
N 10	05 35	06 01	06 22	11 06	11 48	12 34	13 25
0	05 23	05 48	06 10	11 10	11 56	12 46	13 39
S 10	05 10	05 36	05 58	11 14	12 04	12 57	13 54
20	04 53	05 21	05 44	11 19	12 13	13 09	14 09
30	04 32	05 03	05 29	11 25	12 23	13 23	14 27
35	04 19	04 52	05 20	11 28	12 28	13 32	14 37
40	04 02	04 39	05 09	11 32	12 35	13 41	14 49
45	03 42	04 23	04 57	11 36	12 43	13 52	15 03
S 50	03 14	04 04	04 42	11 41	12 52	14 06	15 21
52	03 00	03 54	04 35	11 43	12 56	14 12	15 29
54	02 43	03 43	04 27	11 46	13 01	14 19	15 38
56	02 23	03 31	04 18	11 49	13 06	14 27	15 49
58	01 55	03 16	04 08	11 52	13 12	14 36	16 00
S 60	01 11	02 59	03 56	11 56	13 19	14 46	16 14

Lat.	Ocaso Sol	Crepúsculo Civil	Crepúsculo Náutico	Ocaso Luna 31	Ocaso Luna 1	Ocaso Luna 2	Ocaso Luna 3
°	h m	h m	h m	h m	h m	h m	h m
N 72	14 02	15 51	17 20	25 29	01 29	03 38	06 50
N 70	14 43	16 09	17 27	25 15	01 15	03 10	05 23
68	15 11	16 23	17 34	25 04	01 04	02 49	04 44
66	15 32	16 35	17 39	24 55	00 55	02 33	04 18
64	15 49	16 45	17 44	24 47	00 47	02 20	03 57
62	16 03	16 54	17 48	24 40	00 40	02 09	03 41
60	16 14	17 02	17 52	24 35	00 35	01 59	03 27
N 58	16 24	17 08	17 56	24 30	00 30	01 51	03 15
56	16 33	17 14	17 59	24 25	00 25	01 44	03 05
54	16 41	17 20	18 02	24 21	00 21	01 38	02 56
52	16 48	17 25	18 05	24 18	00 18	01 32	02 48
50	16 54	17 29	18 08	24 15	00 15	01 27	02 41
45	17 08	17 39	18 14	24 08	00 08	01 15	02 26
N 40	17 19	17 48	18 20	24 02	00 02	01 06	02 13
35	17 29	17 55	18 26	23 57	24 58	00 58	02 03
30	17 37	18 02	18 31	23 52	24 51	00 51	01 53
20	17 52	18 15	18 41	23 45	24 39	00 39	01 37
N 10	18 05	18 27	18 52	23 38	24 29	00 29	01 24
0	18 17	18 39	19 04	23 32	24 19	00 19	01 11
S 10	18 29	18 52	19 17	23 26	24 10	00 10	00 58
20	18 43	19 06	19 34	23 19	23 59	24 44	00 44
30	18 58	19 24	19 55	23 11	23 48	24 28	00 28
35	19 07	19 35	20 08	23 07	23 41	24 19	00 19
40	19 17	19 47	20 24	23 02	23 33	24 09	00 09
45	19 30	20 03	20 44	22 57	23 24	23 57	24 36
S 50	19 44	20 22	21 11	22 50	23 13	23 42	24 18
52	19 51	20 32	21 25	22 47	23 08	23 35	24 09
54	19 59	20 42	21 41	22 43	23 03	23 28	24 00
56	20 08	20 54	22 02	22 40	22 57	23 19	23 49
58	20 18	21 09	22 28	22 35	22 50	23 10	23 37
S 60	20 29	21 26	23 08	22 31	22 43	22 59	23 22

Día	SOL E.T. (−) 00h	SOL E.T. (−) 12h	SOL Pas. Mer.	LUNA Pas. Mer. Sup.	LUNA Pas. Mer. Inf.	LUNA Edad	LUNA Fase
d	m s	m s	h m	h m	h m	d	%
31	13 24	13 29	12 13	17 21	04 58	07	39
1	13 33	13 37	12 14	18 08	05 44	08	49
2	13 41	13 44	12 14	18 58	06 32	09	60

T.U.	ARIES	VENUS −4.5		MARTE +0.9		JUPITER −2.5		SATURNO +0.1		ESTRELLAS		
	A.H.G.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.	Nombre	A.H.S.	Dec.
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′		° ′	° ′
3 00	133 14.2	133 45.9	N 1 38.6	261 40.1	S17 36.9	73 54.0	N19 45.9	80 56.8	N16 49.3	Acamar	315 25.6	S40 18.4
01	148 16.7	148 46.5	39.8	276 41.2	37.2	88 56.4	45.9	95 59.3	49.4	Achernar	335 34.1	S57 14.3
02	163 19.2	163 47.1	40.9	291 42.2	37.6	103 58.8	46.0	111 01.7	49.4	Acrux	173 19.8	S63 06.0
03	178 21.6	178 47.8 . .	42.1	306 43.3 . .	37.9	119 01.2 . .	46.0	126 04.1 . .	49.4	Adhara	255 19.8	S28 58.6
04	193 24.1	193 48.4	43.3	321 44.4	38.3	134 03.6	46.0	141 06.5	49.4	Aldebaran	291 00.4	N16 30.6
05	208 26.5	208 49.0	44.4	336 45.5	38.6	149 06.0	46.0	156 08.9	49.4			
06	223 29.0	223 49.7	N 1 45.6	351 46.6	S17 39.0	164 08.4	N19 46.1	171 11.4	N16 49.5	Alioth	166 28.8	N55 57.0
07	238 31.5	238 50.3	46.8	6 47.6	39.3	179 10.8	46.1	186 13.8	49.5	Alkaid	153 06.3	N49 18.3
S 08	253 33.9	253 50.9	47.9	21 48.7	39.7	194 13.1	46.1	201 16.2	49.5	Al Na'ir	27 56.3	S46 57.6
A 09	268 36.4	268 51.5 . .	49.1	36 49.8 . .	40.0	209 15.5 . .	46.1	216 18.6 . .	49.5	Alnilam	275 56.0	S 1 12.2
B 10	283 38.9	283 52.2	50.3	51 50.9	40.4	224 17.9	46.2	231 21.1	49.6	Alphard	218 05.3	S 8 39.8
A 11	298 41.3	298 52.8	51.4	66 52.0	40.7	239 20.3	46.2	246 23.5	49.6			
D 12	313 43.8	313 53.5	N 1 52.6	81 53.1	S17 41.1	254 22.7	N19 46.2	261 25.9	N16 49.6	Alphecca	126 19.3	N26 42.5
13	328 46.3	328 54.1	53.7	96 54.1	41.4	269 25.1	46.2	276 28.3	49.6	Alpheratz	357 53.8	N29 05.7
O 14	343 48.7	343 54.7	54.9	111 55.2	41.8	284 27.5	46.3	291 30.7	49.6	Altair	62 18.0	N 8 52.2
15	358 51.2	358 55.4 . .	56.1	126 56.3 . .	42.1	299 29.8 . .	46.3	306 33.2 . .	49.7	Ankaa	353 25.5	S42 18.4
16	13 53.7	13 56.0	57.2	141 57.4	42.5	314 32.2	46.3	321 35.6	49.7	Antares	112 38.3	S26 25.9
17	28 56.1	28 56.7	58.4	156 58.5	42.9	329 34.6	46.3	336 38.0	49.7			
18	43 58.6	43 57.3	N 1 59.6	171 59.6	S17 43.2	344 37.0	N19 46.4	351 40.4	N16 49.7	Arcturus	146 04.5	N19 10.5
19	59 01.0	58 57.9	2 00.7	187 00.7	43.6	359 39.4	46.4	6 42.9	49.8	Atria	107 49.2	S69 01.5
20	74 03.5	73 58.6	01.9	202 01.7	43.9	14 41.8	46.4	21 45.3	49.8	Avior	234 21.4	S59 30.8
21	89 06.0	88 59.2 . .	03.0	217 02.8 . .	44.2	29 44.1 . .	46.5	36 47.7 . .	49.8	Bellatrix	278 42.2	N 6 20.9
22	104 08.4	103 59.9	04.2	232 03.9	44.6	44 46.5	46.5	51 50.1	49.8	Betelgeuse	271 11.5	N 7 24.3
23	119 10.9	119 00.5	05.4	247 05.0	44.9	59 48.9	46.5	66 52.5	49.8			
4 00	134 13.4	134 01.2	N 2 06.5	262 06.1	S17 45.3	74 51.3	N19 46.5	81 55.0	N16 49.9	Canopus	264 00.0	S52 42.0
01	149 15.8	149 01.8	07.7	277 07.2	45.6	89 53.7	46.6	96 57.4	49.9	Capella	280 48.5	N46 00.0
02	164 18.3	164 02.5	08.8	292 08.2	46.0	104 56.1	46.6	111 59.8	49.9	Deneb	49 38.6	N45 16.9
03	179 20.8	179 03.2 . .	10.0	307 09.3 . .	46.3	119 58.4 . .	46.6	127 02.2 . .	49.9	Denebola	182 43.3	N14 33.9
04	194 23.2	194 03.8	11.1	322 10.4	46.7	135 00.8	46.6	142 04.6	50.0	Diphda	349 05.8	S17 59.1
05	209 25.7	209 04.5	12.3	337 11.5	47.0	150 03.2	46.7	157 07.0	50.0			
06	224 28.2	224 05.1	N 2 13.5	352 12.6	S17 47.4	165 05.6	N19 46.7	172 09.5	N16 50.0	Dubhe	194 02.8	N61 44.6
07	239 30.6	239 05.8	14.6	7 13.7	47.7	180 07.9	46.7	187 11.9	50.0	Elnath	278 24.6	N28 36.5
08	254 33.1	254 06.5	15.8	22 14.8	48.1	195 10.3	46.7	202 14.3	50.1	Eltanin	90 51.0	N51 29.1
D 09	269 35.5	269 07.1 . .	16.9	37 15.8 . .	48.4	210 12.7 . .	46.8	217 16.7 . .	50.1	Enif	33 57.0	N 9 52.7
O 10	284 38.0	284 07.8	18.1	52 16.9	48.8	225 15.1	46.8	232 19.1	50.1	Fomalhaut	15 34.9	S29 37.2
M 11	299 40.5	299 08.4	19.2	67 18.0	49.1	240 17.5	46.8	247 21.6	50.1			
I 12	314 42.9	314 09.1	N 2 20.4	82 19.1	S17 49.5	255 19.8	N19 46.9	262 24.0	N16 50.2	Gacrux	172 11.5	S57 06.9
N 13	329 45.4	329 09.8	21.5	97 20.2	49.8	270 22.2	46.9	277 26.4	50.2	Gienah	176 02.1	S17 32.8
G 14	344 47.9	344 10.5	22.7	112 21.3	50.2	285 24.6	46.9	292 28.8	50.2	Hadar	149 01.6	S60 22.4
O 15	359 50.3	359 11.1 . .	23.8	127 22.3 . .	50.5	300 27.0 . .	46.9	307 31.2 . .	50.2	Hamal	328 11.8	N23 28.0
16	14 52.8	14 11.8	25.0	142 23.4	50.9	315 29.3	47.0	322 33.6	50.2	Kaus Aust.	83 57.0	S34 23.0
17	29 55.3	29 12.5	26.2	157 24.5	51.2	330 31.7	47.0	337 36.1	50.3			
18	44 57.7	44 13.2	N 2 27.3	172 25.6	S17 51.5	345 34.1	N19 47.0	352 38.5	N16 50.3	Kochab	137 19.5	N74 08.8
19	60 00.2	59 13.8	28.5	187 26.7	51.9	0 36.5	47.1	7 40.9	50.3	Markab	13 48.3	N15 12.5
20	75 02.7	74 14.5	29.6	202 27.8	52.2	15 38.8	47.1	22 43.3	50.3	Menkar	314 25.2	N 4 05.5
21	90 05.1	89 15.2 . .	30.8	217 28.9 . .	52.6	30 41.2 . .	47.1	37 45.7 . .	50.4	Menkent	148 19.0	S36 22.3
22	105 07.6	104 15.9	31.9	232 30.0	52.9	45 43.6	47.1	52 48.1	50.4	Miaplacidus	221 40.9	S69 43.3
23	120 10.0	119 16.6	33.1	247 31.0	53.3	60 46.0	47.2	67 50.5	50.4			
5 00	135 12.5	134 17.2	N 2 34.2	262 32.1	S17 53.6	75 48.3	N19 47.2	82 53.0	N16 50.4	Mirfak	308 54.2	N49 52.0
01	150 15.0	149 17.9	35.4	277 33.2	54.0	90 50.7	47.2	97 55.4	50.5	Nunki	76 10.6	S26 17.7
02	165 17.4	164 18.6	36.5	292 34.3	54.3	105 53.1	47.2	112 57.8	50.5	Peacock	53 35.0	S56 43.9
03	180 19.9	179 19.3 . .	37.7	307 35.4 . .	54.6	120 55.4 . .	47.3	128 00.2 . .	50.5	Pollux	243 39.2	N28 01.4
04	195 22.4	194 20.0	38.8	322 36.5	55.0	135 57.8	47.3	143 02.6	50.5	Procyon	245 09.5	N 5 13.2
05	210 24.8	209 20.7	40.0	337 37.6	55.3	151 00.2	47.3	158 05.0	50.6			
06	225 27.3	224 21.4	N 2 41.1	352 38.6	S17 55.7	166 02.6	N19 47.4	173 07.4	N16 50.6	Rasalhague	96 15.7	N12 33.5
07	240 29.8	239 22.1	42.3	7 39.7	56.0	181 04.9	47.4	188 09.9	50.6	Regulus	207 53.5	N11 57.7
08	255 32.2	254 22.8	43.4	22 40.8	56.4	196 07.3	47.4	203 12.3	50.6	Rigel	281 21.2	S 8 12.2
L 09	270 34.7	269 23.5 . .	44.5	37 41.9 . .	56.7	211 09.7 . .	47.4	218 14.7 . .	50.7	Rigil Kent.	140 05.1	S60 50.0
U 10	285 37.1	284 24.2	45.7	52 43.0	57.0	226 12.0	47.5	233 17.1	50.7	Sabik	102 23.8	S15 43.5
N 11	300 39.6	299 24.9	46.8	67 44.1	57.4	241 14.4	47.5	248 19.5	50.7			
E 12	315 42.1	314 25.6	N 2 48.0	82 45.2	S17 57.7	256 16.8	N19 47.5	263 21.9	N16 50.7	Schedar	349 52.0	N56 32.7
S 13	330 44.5	329 26.3	49.1	97 46.3	58.1	271 19.1	47.6	278 24.3	50.8	Shaula	96 35.3	S37 06.1
14	345 47.0	344 27.0	50.3	112 47.3	58.4	286 21.5	47.6	293 26.7	50.8	Sirius	258 42.0	S16 43.2
15	0 49.5	359 27.7 . .	51.4	127 48.4 . .	58.8	301 23.9 . .	47.6	308 29.2 . .	50.8	Spica	158 41.3	S11 09.9
16	15 51.9	14 28.4	52.6	142 49.5	59.1	316 26.2	47.7	323 31.6	50.8	Suhail	222 59.1	S43 26.2
17	30 54.4	29 29.1	53.7	157 50.6	59.4	331 28.6	47.7	338 34.0	50.9			
18	45 56.9	44 29.8	N 2 54.8	172 51.7	S17 59.8	346 31.0	N19 47.7	353 36.4	N16 50.9	Vega	80 45.9	N38 46.9
19	60 59.3	59 30.5	56.0	187 52.8	18 00.1	1 33.3	47.7	8 38.8	50.9	Zuben'ubi	137 16.2	S16 02.7
20	76 01.8	74 31.2	57.1	202 53.9	00.5	16 35.7	47.8	23 41.2	50.9			
21	91 04.3	89 31.9 . .	58.3	217 55.0 . .	00.8	31 38.1 . .	47.8	38 43.6 . .	51.0		A.H.S.	Pas. Mer.
22	106 06.7	104 32.6	2 59.4	232 56.0	01.1	46 40.4	47.8	53 46.0	51.0	Venus	° ′	h m
23	121 09.2	119 33.4	N 3 00.6	247 57.1	01.5	61 42.8	47.9	68 48.4	51.0	Marte	359 47.8	15 03
	h m									Júpiter	127 52.7	6 31
Pas. Mer.	15 00.6	v 0.7	d 1.2	v 1.1	d 0.3	v 2.4	d 0.0	v 2.4	d 0.0	Saturno	300 37.9	18 58
											307 41.6	18 29

T.U.	SOL				LUNA					
	A.H.G.		Dec.		A.H.G.	v	Dec.	d	P.H.	
d h	° ′		° ′		° ′	′	° ′	′	′	
3 00	176 33.1		S16 33.8		72 50.0	8.9	N16 58.6	8.9	58.3	
01	191 33.0		33.1		87 17.9	8.7	17 07.5	8.8	58.4	
02	206 32.9		32.3		101 45.6	8.7	17 16.3	8.8	58.4	
03	221 32.9	. .	31.6		116 13.3	8.5	17 25.1	8.6	58.5	
04	236 32.8		30.8		130 40.8	8.5	17 33.7	8.6	58.5	
05	251 32.7		30.1		145 08.3	8.3	17 42.3	8.4	58.5	
06	266 32.7		S16 29.4		159 35.6	8.2	N17 50.7	8.4	58.6	
07	281 32.6		28.6		174 02.8	8.2	17 59.1	8.3	58.6	
S 08	296 32.6		27.9		188 30.0	8.0	18 07.4	8.2	58.6	
A 09	311 32.5	. .	27.2		202 57.0	7.9	18 15.6	8.1	58.7	
B 10	326 32.4		26.4		217 23.9	7.8	18 23.7	7.9	58.7	
A 11	341 32.4		25.7		231 50.7	7.7	18 31.6	7.9	58.8	
D 12	356 32.3		S16 24.9		246 17.4	7.7	N18 39.5	7.8	58.8	
O 13	11 32.2		24.2		260 44.1	7.5	18 47.3	7.7	58.8	
14	26 32.2		23.5		275 10.6	7.4	18 55.0	7.5	58.9	
15	41 32.1	. .	22.7		289 37.0	7.3	19 02.5	7.5	58.9	
16	56 32.0		22.0		304 03.3	7.1	19 10.0	7.4	59.0	
17	71 32.0		21.2		318 29.4	7.1	19 17.4	7.2	59.0	
18	86 31.9		S16 20.5		332 55.5	7.0	N19 24.6	7.1	59.0	
19	101 31.9		19.8		347 21.5	6.9	19 31.7	7.1	59.1	
20	116 31.8		19.0		1 47.4	6.8	19 38.8	6.9	59.1	
21	131 31.7	. .	18.3		16 13.2	6.6	19 45.7	6.8	59.1	
22	146 31.7		17.5		30 38.8	6.6	19 52.5	6.6	59.2	
23	161 31.6		16.8		45 04.4	6.5	19 59.1	6.6	59.2	
4 00	176 31.6		S16 16.0		59 29.9	6.3	N20 05.7	6.4	59.3	
01	191 31.5		15.3		73 55.2	6.3	20 12.1	6.3	59.3	
02	206 31.4		14.5		88 20.5	6.2	20 18.4	6.2	59.3	
03	221 31.4	. .	13.8		102 45.7	6.1	20 24.6	6.1	59.4	
04	236 31.3		13.0		117 10.8	5.9	20 30.7	5.9	59.4	
05	251 31.3		12.3		131 35.7	5.9	20 36.6	5.8	59.5	
06	266 31.2		S16 11.5		146 00.6	5.8	N20 42.4	5.7	59.5	
07	281 31.2		10.8		160 25.4	5.6	20 48.1	5.6	59.5	
08	296 31.1		10.0		174 50.0	5.6	20 53.7	5.4	59.6	
D 09	311 31.0	. .	09.3		189 14.6	5.5	20 59.1	5.3	59.6	
O 10	326 31.0		08.5		203 39.1	5.4	21 04.4	5.1	59.6	
M 11	341 30.9		07.8		218 03.5	5.3	21 09.5	5.0	59.7	
I 12	356 30.9		S16 07.0		232 27.8	5.2	N21 14.5	4.9	59.7	
N 13	11 30.8		06.3		246 52.0	5.1	21 19.4	4.8	59.7	
G 14	26 30.8		05.5		261 16.1	5.1	21 24.2	4.6	59.8	
O 15	41 30.7	. .	04.8		275 40.2	4.9	21 28.8	4.4	59.8	
16	56 30.7		04.0		290 04.1	4.9	21 33.2	4.3	59.9	
17	71 30.6		03.3		304 28.0	4.7	21 37.5	4.2	59.9	
18	86 30.6		S16 02.5		318 51.7	4.7	N21 41.7	4.1	59.9	
19	101 30.5		01.8		333 15.4	4.6	21 45.8	3.8	60.0	
20	116 30.4		01.0		347 39.0	4.5	21 49.6	3.8	60.0	
21	131 30.4	16	00.3		2 02.5	4.4	21 53.4	3.6	60.0	
22	146 30.3	15	59.5		16 25.9	4.4	21 57.0	3.4	60.1	
23	161 30.3		58.7		30 49.3	4.3	22 00.4	3.3	60.1	
5 00	176 30.2		S15 58.0		45 12.6	4.2	N22 03.7	3.1	60.1	
01	191 30.2		57.2		59 35.8	4.1	22 06.8	3.0	60.2	
02	206 30.1		56.5		73 58.9	4.0	22 09.8	2.8	60.2	
03	221 30.1	. .	55.7		88 21.9	4.0	22 12.6	2.7	60.2	
04	236 30.0		55.0		102 44.9	3.9	22 15.3	2.5	60.3	
05	251 30.0		54.2		117 07.8	3.9	22 17.8	2.4	60.3	
06	266 29.9		S15 53.4		131 30.7	3.8	N22 20.2	2.2	60.3	
07	281 29.9		52.7		145 53.5	3.7	22 22.4	2.0	60.4	
08	296 29.8		51.9		160 16.2	3.6	22 24.4	1.9	60.4	
L 09	311 29.8	. .	51.2		174 38.8	3.6	22 26.3	1.7	60.4	
U 10	326 29.8		50.4		189 01.4	3.5	22 28.0	1.6	60.4	
N 11	341 29.7		49.6		203 23.9	3.5	22 29.6	1.3	60.5	
E 12	356 29.7		S15 48.9		217 46.4	3.4	N22 30.9	1.3	60.5	
S 13	11 29.6		48.1		232 08.8	3.4	22 32.2	1.0	60.5	
14	26 29.6		47.3		246 31.2	3.3	22 33.2	0.9	60.6	
15	41 29.5	. .	46.6		260 53.5	3.3	22 34.1	0.8	60.6	
16	56 29.5		45.8		275 15.8	3.2	22 34.9	0.5	60.6	
17	71 29.4		45.1		289 38.0	3.2	22 35.4	0.4	60.7	
18	86 29.4		S15 44.3		304 00.2	3.1	N22 35.8	0.3	60.7	
19	101 29.3		43.5		318 22.3	3.1	22 36.1	0.0	60.7	
20	116 29.3		42.8		332 44.4	3.0	22 36.1	0.1	60.7	
21	131 29.3	. .	42.0		347 06.4	3.1	22 36.0	0.2	60.8	
22	146 29.2		41.2		1 28.5	3.0	22 35.8	0.5	60.8	
23	161 29.2		40.5		15 50.5	2.9	N22 35.3	0.6	60.8	
	SD 16.2		d 0.8		SD	16.0	16.3		16.5	

Lat.	Crepúsculo Náutico	Crepúsculo Civil	Orto Sol	Orto Luna 3	Orto Luna 4	Orto Luna 5	Orto Luna 6
°	h m	h m	h m	h m	h m	h m	h m
N 72	06 58	08 25	10 03	07 44	▭	▭	▭
N 70	06 52	08 08	09 29	09 12	▭	▭	▭
68	06 46	07 55	09 04	09 52	09 41	▭	▭
66	06 41	07 44	08 45	10 19	10 29	10 57	12 08
64	06 37	07 35	08 30	10 41	11 00	11 38	12 48
62	06 33	07 27	08 17	10 58	11 24	12 07	13 15
60	06 30	07 20	08 07	11 12	11 42	12 28	13 37
N 58	06 27	07 14	07 57	11 25	11 58	12 46	13 54
56	06 24	07 08	07 49	11 35	12 11	13 01	14 09
54	06 21	07 03	07 42	11 45	12 23	13 14	14 21
52	06 18	06 59	07 35	11 53	12 33	13 25	14 32
50	06 16	06 55	07 29	12 01	12 42	13 36	14 42
45	06 10	06 45	07 16	12 17	13 02	13 57	15 03
N 40	06 05	06 37	07 06	12 31	13 18	14 14	15 20
35	06 00	06 30	06 56	12 42	13 31	14 28	15 34
30	05 55	06 24	06 48	12 52	13 43	14 41	15 46
20	05 45	06 12	06 34	13 10	14 03	15 03	16 07
N 10	05 35	06 00	06 22	13 25	14 21	15 21	16 25
0	05 24	05 49	06 10	13 39	14 37	15 39	16 42
S 10	05 11	05 37	05 59	13 54	14 54	15 56	17 00
20	04 55	05 23	05 46	14 09	15 11	16 15	17 18
30	04 35	05 06	05 31	14 27	15 32	16 37	17 39
35	04 22	04 55	05 23	14 37	15 44	16 50	17 51
40	04 07	04 43	05 13	14 49	15 58	17 04	18 05
45	03 47	04 28	05 01	15 03	16 14	17 22	18 22
S 50	03 21	04 10	04 47	15 21	16 35	17 44	18 42
52	03 08	04 01	04 40	15 29	16 45	17 54	18 52
54	02 53	03 51	04 33	15 38	16 56	18 06	19 03
56	02 34	03 39	04 25	15 49	17 08	18 19	19 16
58	02 10	03 25	04 16	16 00	17 22	18 34	19 30
S 60	01 35	03 09	04 05	16 14	17 40	18 53	19 47

Lat.	Ocaso Sol	Crepúsculo Civil	Crepúsculo Náutico	Ocaso Luna 3	Ocaso Luna 4	Ocaso Luna 5	Ocaso Luna 6
°	h m	h m	h m	h m	h m	h m	h m
N 72	14 26	16 05	17 31	06 50	▭	▭	▭
N 70	15 00	16 21	17 38	05 23	▭	▭	▭
68	15 25	16 34	17 43	04 44	06 53	▭	▭
66	15 44	16 45	17 48	04 18	06 06	07 45	08 47
64	15 59	16 54	17 52	03 57	05 35	07 04	08 07
62	16 11	17 02	17 56	03 41	05 12	06 36	07 40
60	16 22	17 09	17 59	03 27	04 54	06 14	07 18
N 58	16 32	17 15	18 02	03 15	04 39	05 56	07 00
56	16 40	17 20	18 05	03 05	04 26	05 42	06 46
54	16 47	17 25	18 08	02 56	04 15	05 29	06 33
52	16 54	17 30	18 10	02 48	04 05	05 18	06 22
50	16 59	17 34	18 13	02 41	03 56	05 08	06 12
45	17 12	17 43	18 18	02 26	03 37	04 47	05 51
N 40	17 23	17 51	18 23	02 13	03 22	04 30	05 34
35	17 32	17 58	18 28	02 03	03 09	04 15	05 19
30	17 40	18 05	18 33	01 53	02 58	04 03	05 07
20	17 54	18 17	18 43	01 37	02 39	03 42	04 45
N 10	18 06	18 28	18 53	01 24	02 22	03 23	04 26
0	18 17	18 39	19 04	01 11	02 06	03 06	04 09
S 10	18 29	18 51	19 17	00 58	01 51	02 49	03 51
20	18 42	19 05	19 32	00 44	01 34	02 30	03 33
30	18 56	19 22	19 52	00 28	01 15	02 09	03 11
35	19 05	19 32	20 05	00 19	01 04	01 57	02 58
40	19 14	19 44	20 20	00 09	00 51	01 42	02 44
45	19 26	19 59	20 39	24 36	00 36	01 26	02 26
S 50	19 40	20 17	21 05	24 18	00 18	01 05	02 04
52	19 46	20 26	21 18	24 09	00 09	00 55	01 54
54	19 54	20 36	21 33	24 00	00 00	00 44	01 43
56	20 02	20 47	21 51	23 49	24 31	00 31	01 29
58	20 11	21 00	22 14	23 37	24 16	00 16	01 14
S 60	20 21	21 16	22 47	23 22	23 59	24 55	00 55

Día	SOL E.T. (−) 00h	SOL E.T. (−) 12h	SOL Pas. Mer.	LUNA Pas. Mer. Sup.	LUNA Pas. Mer. Inf.	LUNA Edad	LUNA Fase
d	m s	m s	h m	h m	h m	d	%
3	13 48	13 51	12 14	19 53	07 25	10	70
4	13 54	13 56	12 14	20 51	08 22	11	80
5	13 59	14 01	12 14	21 54	09 22	12	89

T.U.	ARIES	VENUS −4.6		MARTE +0.8		JUPITER −2.4		SATURNO +0.1	
	A.H.G.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
9 00	139 09.1	135 29.6	N 4 22.7	264 16.9	S18 25.8	79 34.4	N19 50.2	86 43.9	N16 53.0
01	154 11.5	150 30.5	23.8	279 17.9	26.1	94 36.8	50.2	101 46.3	53.0
02	169 14.0	165 31.3	24.9	294 19.0	26.4	109 39.1	50.3	116 48.7	53.0
03	184 16.5	180 32.1	26.0	309 20.1	26.7	124 41.4	50.3	131 51.1	53.1
04	199 18.9	195 33.0	27.1	324 21.2	27.1	139 43.8	50.3	146 53.5	53.1
05	214 21.4	210 33.8	28.2	339 22.3	27.4	154 46.1	50.4	161 55.9	53.1
06	229 23.9	225 34.6	N 4 29.3	354 23.4	S18 27.7	169 48.5	N19 50.4	176 58.3	N16 53.1
07	244 26.3	240 35.5	30.4	9 24.5	28.0	184 50.8	50.5	192 00.6	53.2
V 08	259 28.8	255 36.3	31.5	24 25.6	28.4	199 53.1	50.5	207 03.0	53.2
I 09	274 31.2	270 37.1	32.6	39 26.7	28.7	214 55.5	50.5	222 05.4	53.2
E 10	289 33.7	285 38.0	33.7	54 27.8	29.0	229 57.8	50.6	237 07.8	53.3
R 11	304 36.2	300 38.8	34.8	69 28.9	29.3	245 00.1	50.6	252 10.2	53.3
N 12	319 38.6	315 39.7	N 4 35.9	84 30.0	S18 29.6	260 02.5	N19 50.6	267 12.6	N16 53.3
E 13	334 41.1	330 40.5	37.0	99 31.1	30.0	275 04.8	50.7	282 15.0	53.3
S 14	349 43.6	345 41.4	38.1	114 32.2	30.3	290 07.1	50.7	297 17.4	53.4
15	4 46.0	0 42.2	39.2	129 33.3	30.6	305 09.5	50.7	312 19.8	53.4
16	19 48.5	15 43.1	40.3	144 34.4	30.9	320 11.8	50.8	327 22.2	53.4
17	34 51.0	30 43.9	41.4	159 35.5	31.3	335 14.1	50.8	342 24.6	53.5
18	49 53.4	45 44.8	N 4 42.5	174 36.6	S18 31.6	350 16.5	N19 50.8	357 27.0	N16 53.5
19	64 55.9	60 45.6	43.6	189 37.7	31.9	5 18.8	50.9	12 29.4	53.5
20	79 58.3	75 46.5	44.7	204 38.8	32.2	20 21.1	50.9	27 31.8	53.5
21	95 00.8	90 47.3	45.8	219 39.9	32.5	35 23.5	51.0	42 34.2	53.6
22	110 03.3	105 48.2	46.9	234 41.0	32.9	50 25.8	51.0	57 36.5	53.6
23	125 05.7	120 49.1	48.0	249 42.1	33.2	65 28.1	51.0	72 38.9	53.6
10 00	140 08.2	135 49.9	N 4 49.1	264 43.2	S18 33.5	80 30.5	N19 51.1	87 41.3	N16 53.7
01	155 10.7	150 50.8	50.2	279 44.3	33.8	95 32.8	51.1	102 43.7	53.7
02	170 13.1	165 51.6	51.3	294 45.4	34.2	110 35.1	51.1	117 46.1	53.7
03	185 15.6	180 52.5	52.4	309 46.5	34.5	125 37.4	51.2	132 48.5	53.8
04	200 18.1	195 53.4	53.5	324 47.6	34.8	140 39.8	51.2	147 50.9	53.8
05	215 20.5	210 54.3	54.6	339 48.7	35.1	155 42.1	51.2	162 53.3	53.8
06	230 23.0	225 55.1	N 4 55.7	354 49.8	S18 35.4	170 44.4	N19 51.3	177 55.7	N16 53.8
S 07	245 25.5	240 56.0	56.7	9 50.9	35.7	185 46.8	51.3	192 58.1	53.9
A 08	260 27.9	255 56.9	57.8	24 52.0	36.1	200 49.1	51.3	208 00.5	53.9
B 09	275 30.4	270 57.8	4 58.9	39 53.1	36.4	215 51.4	51.4	223 02.8	53.9
10	290 32.8	285 58.6	5 00.0	54 54.2	36.7	230 53.7	51.4	238 05.2	54.0
A 11	305 35.3	300 59.5	01.1	69 55.3	37.0	245 56.1	51.5	253 07.6	54.0
D 12	320 37.8	316 00.4	N 5 02.2	84 56.4	S18 37.3	260 58.4	N19 51.5	268 10.0	N16 54.0
O 13	335 40.2	331 01.3	03.3	99 57.5	37.7	276 00.7	51.5	283 12.4	54.1
14	350 42.7	346 02.2	04.4	114 58.6	38.0	291 03.0	51.6	298 14.8	54.1
15	5 45.2	1 03.1	05.5	129 59.7	38.3	306 05.4	51.6	313 17.2	54.1
16	20 47.6	16 04.0	06.5	145 00.8	38.6	321 07.7	51.6	328 19.6	54.1
17	35 50.1	31 04.8	07.6	160 01.9	38.9	336 10.0	51.7	343 22.0	54.2
18	50 52.6	46 05.7	N 5 08.7	175 03.0	S18 39.3	351 12.3	N19 51.7	358 24.3	N16 54.2
19	65 55.0	61 06.6	09.8	190 04.1	39.6	6 14.7	51.8	13 26.7	54.2
20	80 57.5	76 07.5	10.9	205 05.2	39.9	21 17.0	51.8	28 29.1	54.3
21	96 00.0	91 08.4	12.0	220 06.3	40.2	36 19.3	51.8	43 31.5	54.3
22	111 02.4	106 09.3	13.1	235 07.4	40.5	51 21.6	51.9	58 33.9	54.3
23	126 04.9	121 10.2	14.1	250 08.5	40.8	66 24.0	51.9	73 36.3	54.4
11 00	141 07.3	136 11.1	N 5 15.2	265 09.6	S18 41.1	81 26.3	N19 51.9	88 38.7	N16 54.4
01	156 09.8	151 12.0	16.3	280 10.7	41.5	96 28.6	52.0	103 41.1	54.4
02	171 12.3	166 12.9	17.4	295 11.8	41.8	111 30.9	52.0	118 43.4	54.4
03	186 14.7	181 13.8	18.5	310 12.9	42.1	126 33.2	52.1	133 45.8	54.5
04	201 17.2	196 14.8	19.5	325 14.0	42.4	141 35.6	52.1	148 48.2	54.5
05	216 19.7	211 15.7	20.6	340 15.1	42.7	156 37.9	52.1	163 50.6	54.5
06	231 22.1	226 16.6	N 5 21.7	355 16.2	S18 43.0	171 40.2	N19 52.2	178 53.0	N16 54.6
07	246 24.6	241 17.5	22.8	10 17.3	43.4	186 42.5	52.2	193 55.4	54.6
D 08	261 27.1	256 18.4	23.9	25 18.4	43.7	201 44.8	52.2	208 57.8	54.6
O 09	276 29.5	271 19.3	24.9	40 19.5	44.0	216 47.2	52.3	224 00.1	54.7
M 10	291 32.0	286 20.2	26.0	55 20.6	44.3	231 49.5	52.3	239 02.5	54.7
I 11	306 34.4	301 21.2	27.1	70 21.7	44.6	246 51.8	52.4	254 04.9	54.7
N 12	321 36.9	316 22.1	N 5 28.2	85 22.8	S18 44.9	261 54.1	N19 52.4	269 07.3	N16 54.8
G 13	336 39.4	331 23.0	29.2	100 23.9	45.2	276 56.4	52.4	284 09.7	54.8
O 14	351 41.8	346 23.9	30.3	115 25.0	45.6	291 58.7	52.5	299 12.1	54.8
15	6 44.3	1 24.9	31.4	130 26.1	45.9	307 01.1	52.5	314 14.5	54.9
16	21 46.8	16 25.8	32.5	145 27.2	46.2	322 03.4	52.6	329 16.8	54.9
17	36 49.2	31 26.7	33.5	160 28.3	46.5	337 05.7	52.6	344 19.2	54.9
18	51 51.7	46 27.7	N 5 34.6	175 29.4	S18 46.8	352 08.0	N19 52.6	359 21.6	N16 54.9
19	66 54.2	61 28.6	35.7	190 30.5	47.1	7 10.3	52.7	14 24.0	55.0
20	81 56.6	76 29.5	36.7	205 31.6	47.4	22 12.6	52.7	29 26.4	55.0
21	96 59.1	91 30.5	37.8	220 32.7	47.7	37 15.0	52.7	44 28.8	55.0
22	112 01.6	106 31.4	38.9	235 33.8	48.1	52 17.3	52.8	59 31.1	55.1
23	127 04.0	121 32.4	40.0	250 34.9	48.4	67 19.6	52.8	74 33.5	55.1
	h m								
Pas. Mer.	14 37.1	*v* 0.9	*d* 1.1	*v* 1.1	*d* 0.3	*v* 2.3	*d* 0.0	*v* 2.4	*d* 0.0

ESTRELLAS

Nombre	A.H.S.	Dec.
	° ′	° ′
Acamar	315 25.7	S40 18.4
Achernar	335 34.1	S57 14.3
Acrux	173 19.8	S63 06.0
Adhara	255 19.8	S28 58.6
Aldebaran	291 00.4	N16 30.6
Alioth	166 28.7	N55 57.1
Alkaid	153 06.3	N49 18.3
Al Na'ir	27 56.2	S46 57.5
Alnilam	275 56.0	S 1 12.2
Alphard	218 05.3	S 8 39.9
Alphecca	126 19.2	N26 42.5
Alpheratz	357 53.8	N29 05.7
Altair	62 18.0	N 8 52.1
Ankaa	353 25.5	S42 18.3
Antares	112 38.3	S26 26.0
Arcturus	146 04.5	N19 10.5
Atria	107 49.1	S69 01.5
Avior	234 21.4	S59 30.9
Bellatrix	278 42.2	N 6 20.9
Betelgeuse	271 11.6	N 7 24.3
Canopus	264 00.0	S52 42.0
Capella	280 48.5	N46 00.0
Deneb	49 38.5	N45 16.9
Denebola	182 43.2	N14 33.9
Diphda	349 05.8	S17 59.1
Dubhe	194 02.8	N61 44.6
Elnath	278 24.6	N28 36.5
Eltanin	90 51.0	N51 29.1
Enif	33 56.9	N 9 52.6
Fomalhaut	15 34.9	S29 37.2
Gacrux	172 11.4	S57 06.9
Gienah	176 02.0	S17 32.8
Hadar	149 01.5	S60 22.4
Hamal	328 11.8	N23 28.0
Kaus Aust.	83 56.9	S34 23.0
Kochab	137 19.4	N74 08.8
Markab	13 48.3	N15 12.5
Menkar	314 25.2	N 4 05.5
Menkent	148 18.9	S36 22.3
Miaplacidus	221 40.9	S69 43.3
Mirfak	308 54.2	N49 52.0
Nunki	76 10.6	S26 17.7
Peacock	53 34.9	S56 43.9
Pollux	243 39.2	N28 01.4
Procyon	245 09.5	N 5 13.2
Rasalhague	96 15.6	N12 33.4
Regulus	207 53.5	N11 57.7
Rigel	281 21.2	S 8 12.2
Rigil Kent.	140 05.0	S60 50.0
Sabik	102 23.8	S15 43.5
Schedar	349 52.0	N56 32.7
Shaula	96 35.3	S37 06.2
Sirius	258 42.0	S16 43.2
Spica	158 41.3	S11 10.0
Suhail	222 59.1	S43 26.3
Vega	80 45.8	N38 46.9
Zuben'ubi	137 16.1	S16 02.7

	A.H.S.	Pas. Mer.
	° ′	h m
Venus	355 41.7	14 56
Marte	124 35.0	6 21
Júpiter	300 22.2	18 35
Saturno	307 33.1	18 06

T.U.	SOL				LUNA						
	A.H.G.		Dec.		A.H.G.	v		Dec.	d	P.H.	
d h	°	′	°	′	°	′	′	°	′	′	′
VIERNES 9 00	176	27.0	S14	43.2	345	28.0	6.0	N14	49.7	11.3	61.2
01	191	27.0		42.4	359	53.0	6.1	14	38.4	11.5	61.2
02	206	27.0		41.6	14	18.1	6.1	14	26.9	11.5	61.2
03	221	27.0	. .	40.8	28	43.2	6.2	14	15.4	11.6	61.2
04	236	26.9		40.0	43	08.4	6.3	14	03.8	11.7	61.2
05	251	26.9		39.2	57	33.7	6.4	13	52.1	11.8	61.2
06	266	26.9	S14	38.4	71	59.1	6.5	N13	40.3	11.8	61.1
07	281	26.9		37.6	86	24.6	6.6	13	28.5	12.0	61.1
08	296	26.9		36.8	100	50.2	6.6	13	16.5	12.0	61.1
09	311	26.9	. .	36.0	115	15.8	6.7	13	04.5	12.1	61.1
10	326	26.9		35.2	129	41.5	6.9	12	52.4	12.2	61.1
11	341	26.8		34.3	144	07.4	6.9	12	40.2	12.2	61.0
12	356	26.8	S14	33.5	158	33.3	7.0	N12	28.0	12.4	61.0
13	11	26.8		32.7	172	59.3	7.0	12	15.6	12.4	61.0
14	26	26.8		31.9	187	25.3	7.2	12	03.2	12.4	61.0
15	41	26.8	. .	31.1	201	51.5	7.2	11	50.8	12.6	61.0
16	56	26.8		30.3	216	17.7	7.4	11	38.2	12.6	60.9
17	71	26.8		29.5	230	44.1	7.4	11	25.6	12.6	60.9
18	86	26.8	S14	28.7	245	10.5	7.5	N11	13.0	12.8	60.9
19	101	26.7		27.9	259	37.0	7.6	11	00.2	12.8	60.9
20	116	26.7		27.1	274	03.6	7.6	10	47.4	12.8	60.8
21	131	26.7	. .	26.3	288	30.2	7.8	10	34.6	12.9	60.8
22	146	26.7		25.5	302	57.0	7.8	10	21.7	13.0	60.8
23	161	26.7		24.7	317	23.8	7.9	10	08.7	13.0	60.8
SABADO 10 00	176	26.7	S14	23.8	331	50.7	8.0	N 9	55.7	13.0	60.7
01	191	26.7		23.0	346	17.7	8.1	9	42.7	13.1	60.7
02	206	26.7		22.2	0	44.8	8.1	9	29.6	13.2	60.7
03	221	26.7	. .	21.4	15	11.9	8.3	9	16.4	13.2	60.7
04	236	26.7		20.6	29	39.2	8.3	9	03.2	13.2	60.6
05	251	26.7		19.8	44	06.5	8.3	8	50.0	13.3	60.6
06	266	26.6	S14	19.0	58	33.8	8.5	N 8	36.7	13.3	60.6
07	281	26.6		18.2	73	01.3	8.6	8	23.4	13.4	60.5
08	296	26.6		17.3	87	28.9	8.6	8	10.0	13.4	60.5
09	311	26.6	. .	16.5	101	56.5	8.7	7	56.6	13.4	60.5
10	326	26.6		15.7	116	24.2	8.7	7	43.2	13.4	60.4
11	341	26.6		14.9	130	51.9	8.9	7	29.8	13.5	60.4
12	356	26.6	S14	14.1	145	19.8	8.9	N 7	16.3	13.6	60.4
13	11	26.6		13.3	159	47.7	9.0	7	02.7	13.5	60.3
14	26	26.6		12.5	174	15.7	9.1	6	49.2	13.6	60.3
15	41	26.6	. .	11.6	188	43.8	9.1	6	35.6	13.6	60.3
16	56	26.6		10.8	203	11.9	9.2	6	22.0	13.6	60.2
17	71	26.6		10.0	217	40.1	9.3	6	08.4	13.6	60.2
18	86	26.6	S14	09.2	232	08.4	9.3	N 5	54.8	13.7	60.2
19	101	26.6		08.4	246	36.7	9.4	5	41.1	13.6	60.1
20	116	26.6		07.6	261	05.1	9.5	5	27.5	13.7	60.1
21	131	26.6	. .	06.7	275	33.6	9.6	5	13.8	13.7	60.1
22	146	26.6		05.9	290	02.2	9.6	5	00.1	13.7	60.0
23	161	26.6		05.1	304	30.8	9.6	4	46.4	13.8	60.0
DOMINGO 11 00	176	26.6	S14	04.3	318	59.4	9.8	N 4	32.6	13.7	60.0
01	191	26.6		03.5	333	28.2	9.8	4	18.9	13.7	59.9
02	206	26.6		02.6	347	57.0	9.9	4	05.2	13.8	59.9
03	221	26.6	. .	01.8	2	25.9	9.9	3	51.4	13.7	59.9
04	236	26.6		01.0	16	54.8	10.0	3	37.7	13.8	59.8
05	251	26.6	14	00.2	31	23.8	10.0	3	23.9	13.7	59.8
06	266	26.6	S13	59.3	45	52.8	10.1	N 3	10.2	13.8	59.8
07	281	26.6		58.5	60	21.9	10.2	2	56.4	13.7	59.7
08	296	26.6		57.7	74	51.1	10.2	2	42.7	13.8	59.7
09	311	26.6	. .	56.9	89	20.3	10.3	2	28.9	13.7	59.6
10	326	26.6		56.0	103	49.6	10.4	2	15.2	13.8	59.6
11	341	26.6		55.2	118	19.0	10.3	2	01.4	13.7	59.6
12	356	26.6	S13	54.4	132	48.3	10.5	N 1	47.7	13.7	59.5
13	11	26.6		53.6	147	17.8	10.5	1	34.0	13.7	59.5
14	26	26.6		52.7	161	47.3	10.5	1	20.3	13.7	59.4
15	41	26.6	. .	51.9	176	16.8	10.6	1	06.6	13.7	59.4
16	56	26.6		51.1	190	46.4	10.7	0	52.9	13.7	59.4
17	71	26.6		50.3	205	16.1	10.7	0	39.2	13.7	59.3
18	86	26.6	S13	49.4	219	45.8	10.7	N 0	25.5	13.6	59.3
19	101	26.6		48.6	234	15.5	10.8	N 0	11.9	13.6	59.2
20	116	26.6		47.8	248	45.3	10.9	S 0	01.7	13.6	59.2
21	131	26.6	. .	47.0	263	15.2	10.9	0	15.3	13.6	59.2
22	146	26.6		46.1	277	45.1	10.9	0	28.9	13.6	59.1
23	161	26.6		45.3	292	15.0	11.0	S 0	42.5	13.5	59.1
	SD	16.2	d	0.8	SD		16.6		16.5		16.2

Lat.	Crepúsculo Náutico	Crepúsculo Civil	Orto Sol	Orto Luna 9	Orto Luna 10	Orto Luna 11	Orto Luna 12
°	h m	h m	h m	h m	h m	h m	h m
N 72	06 35	07 57	09 23	17 07	19 27	21 35	23 33
N 70	06 31	07 45	08 58	17 27	19 35	21 34	23 29
68	06 28	07 34	08 39	17 42	19 41	21 33	23 21
66	06 25	07 26	08 24	17 55	19 47	21 33	23 15
64	06 22	07 18	08 11	18 05	19 51	21 33	23 10
62	06 19	07 12	08 00	18 14	19 55	21 32	23 05
60	06 17	07 06	07 51	18 22	19 59	21 32	23 01
N 58	06 15	07 01	07 43	18 28	20 02	21 32	22 58
56	06 13	06 57	07 36	18 34	20 05	21 31	22 55
54	06 11	06 53	07 30	18 39	20 07	21 31	22 52
52	06 09	06 49	07 24	18 44	20 09	21 31	22 50
50	06 07	06 46	07 19	18 48	20 11	21 31	22 47
45	06 03	06 38	07 08	18 58	20 15	21 30	22 42
N 40	05 59	06 31	06 59	19 05	20 19	21 30	22 38
35	05 55	06 25	06 51	19 12	20 22	21 30	22 35
30	05 51	06 19	06 44	19 17	20 25	21 30	22 32
20	05 43	06 09	06 32	19 27	20 30	21 29	22 26
N 10	05 34	05 59	06 21	19 36	20 34	21 29	22 22
0	05 25	05 49	06 11	19 44	20 38	21 29	22 18
S 10	05 13	05 39	06 00	19 52	20 42	21 28	22 13
20	04 59	05 26	05 49	20 00	20 46	21 28	22 09
30	04 41	05 11	05 36	20 10	20 50	21 28	22 04
35	04 30	05 02	05 29	20 16	20 53	21 28	22 01
40	04 16	04 51	05 20	20 22	20 56	21 28	21 58
45	03 58	04 38	05 10	20 29	21 00	21 27	21 54
S 50	03 35	04 21	04 58	20 38	21 04	21 27	21 50
52	03 24	04 14	04 52	20 42	21 06	21 27	21 47
54	03 11	04 05	04 46	20 47	21 08	21 27	21 45
56	02 55	03 55	04 38	20 51	21 10	21 27	21 43
58	02 36	03 43	04 30	20 57	21 13	21 27	21 40
S 60	02 11	03 29	04 21	21 03	21 16	21 27	21 37

Lat.	Ocaso Sol	Crepúsculo Civil	Crepúsculo Náutico	Ocaso Luna 9	Ocaso Luna 10	Ocaso Luna 11	Ocaso Luna 12
°	h m	h m	h m	h m	h m	h m	h m
N 72	15 07	16 33	17 55	10 16	09 51	09 31	09 12
N 70	15 32	16 45	17 59	09 54	09 40	09 28	09 17
68	15 51	16 55	18 02	09 37	09 31	09 25	09 20
66	16 06	17 04	18 05	09 23	09 24	09 23	09 23
64	16 19	17 11	18 08	09 11	09 17	09 22	09 25
62	16 29	17 18	18 10	09 01	09 12	09 20	09 28
60	16 38	17 23	18 12	08 52	09 07	09 19	09 29
N 58	16 46	17 28	18 14	08 45	09 03	09 18	09 31
56	16 53	17 32	18 16	08 38	08 59	09 16	09 33
54	16 59	17 37	18 18	08 32	08 55	09 15	09 34
52	17 05	17 40	18 20	08 26	08 52	09 15	09 35
50	17 10	17 44	18 22	08 21	08 49	09 14	09 36
45	17 21	17 51	18 26	08 10	08 43	09 12	09 39
N 40	17 30	17 58	18 30	08 01	08 38	09 10	09 41
35	17 38	18 04	18 34	07 54	08 33	09 09	09 43
30	17 45	18 09	18 38	07 47	08 29	09 08	09 45
20	17 57	18 19	18 46	07 35	08 22	09 06	09 47
N 10	18 08	18 29	18 54	07 24	08 16	09 04	09 50
0	18 18	18 39	19 04	07 14	08 10	09 02	09 52
S 10	18 28	18 50	19 15	07 04	08 04	09 00	09 54
20	18 39	19 02	19 29	06 53	07 57	08 58	09 57
30	18 52	19 17	19 47	06 41	07 50	08 56	10 00
35	18 59	19 26	19 58	06 34	07 46	08 55	10 01
40	19 08	19 37	20 12	06 25	07 41	08 53	10 03
45	19 18	19 50	20 29	06 16	07 35	08 51	10 05
S 50	19 30	20 06	20 51	06 04	07 28	08 49	10 07
52	19 35	20 13	21 02	05 58	07 25	08 48	10 09
54	19 42	20 22	21 15	05 52	07 21	08 47	10 10
56	19 49	20 32	21 31	05 45	07 17	08 46	10 11
58	19 56	20 43	21 49	05 38	07 13	08 45	10 13
S 60	20 05	20 57	22 13	05 29	07 08	08 43	10 15

Día	SOL E.T. (−) 00h	SOL E.T. (−) 12h	SOL Pas. Mer.	LUNA Pas. Mer. Sup.	LUNA Pas. Mer. Inf.	LUNA Edad	LUNA Fase
d	m s	m s	h m	h m	h m	d	%
9	14 12	14 13	12 14	01 00	13 29	16	98
10	14 13	14 14	12 14	01 57	14 24	17	93
11	14 14	14 14	12 14	02 50	15 15	18	86

T.U.	ARIES	VENUS −4.6		MARTE +0.8		JUPITER −2.4		SATURNO +0.1	
	A.H.G.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
12 00	142 06.5	136 33.3	N 5 41.0	265 36.0	S18 48.7	82 21.9	N19 52.9	89 35.9	N16 55.1
01	157 08.9	151 34.2	42.1	280 37.1	49.0	97 24.2	52.9	104 38.3	55.2
02	172 11.4	166 35.2	43.2	295 38.2	49.3	112 26.5	52.9	119 40.7	55.2
03	187 13.9	181 36.1 . .	44.2	310 39.3 . .	49.6	127 28.8 . .	53.0	134 43.0 . .	55.2
04	202 16.3	196 37.1	45.3	325 40.4	49.9	142 31.2	53.0	149 45.4	55.3
05	217 18.8	211 38.0	46.4	340 41.5	50.2	157 33.5	53.1	164 47.8	55.3
06	232 21.3	226 39.0	N 5 47.4	355 42.6	S18 50.5	172 35.8	N19 53.1	179 50.2	N16 55.3
07	247 23.7	241 40.0	48.5	10 43.7	50.9	187 38.1	53.1	194 52.6	55.4
08	262 26.2	256 40.9	49.5	25 44.9	51.2	202 40.4	53.2	209 55.0	55.4
L 09	277 28.7	271 41.9 . .	50.6	40 46.0 . .	51.5	217 42.7 . .	53.2	224 57.3 . .	55.4
10	292 31.1	286 42.8	51.7	55 47.1	51.8	232 45.0	53.3	239 59.7	55.5
U 11	307 33.6	301 43.8	52.7	70 48.2	52.1	247 47.3	53.3	255 02.1	55.5
N 12	322 36.0	316 44.8	N 5 53.8	85 49.3	S18 52.4	262 49.6	N19 53.3	270 04.5	N16 55.5
E 13	337 38.5	331 45.7	54.9	100 50.4	52.7	277 51.9	53.4	285 06.9	55.5
14	352 41.0	346 46.7	55.9	115 51.5	53.0	292 54.3	53.4	300 09.2	55.6
S 15	7 43.4	1 47.7 . .	57.0	130 52.6 . .	53.3	307 56.6 . .	53.5	315 11.6 . .	55.6
16	22 45.9	16 48.6	58.0	145 53.7	53.6	322 58.9	53.5	330 14.0	55.6
17	37 48.4	31 49.6	5 59.1	160 54.8	53.9	338 01.2	53.5	345 16.4	55.7
18	52 50.8	46 50.6	N 6 00.1	175 55.9	S18 54.2	353 03.5	N19 53.6	0 18.8	N16 55.7
19	67 53.3	61 51.6	01.2	190 57.0	54.6	8 05.8	53.6	15 21.1	55.7
20	82 55.8	76 52.5	02.3	205 58.1	54.9	23 08.1	53.7	30 23.5	55.8
21	97 58.2	91 53.5 . .	03.3	220 59.2 . .	55.2	38 10.4 . .	53.7	45 25.9 . .	55.8
22	113 00.7	106 54.5	04.4	236 00.3	55.5	53 12.7	53.7	60 28.3	55.8
23	128 03.2	121 55.5	05.4	251 01.4	55.8	68 15.0	53.8	75 30.6	55.9
13 00	143 05.6	136 56.5	N 6 06.5	266 02.5	S18 56.1	83 17.3	N19 53.8	90 33.0	N16 55.9
01	158 08.1	151 57.4	07.5	281 03.7	56.4	98 19.6	53.9	105 35.4	55.9
02	173 10.5	166 58.4	08.6	296 04.8	56.7	113 21.9	53.9	120 37.8	56.0
03	188 13.0	181 59.4 . .	09.6	311 05.9 . .	57.0	128 24.2 . .	53.9	135 40.2 . .	56.0
04	203 15.5	197 00.4	10.7	326 07.0	57.3	143 26.5	54.0	150 42.5	56.0
05	218 17.9	212 01.4	11.7	341 08.1	57.6	158 28.8	54.0	165 44.9	56.1
06	233 20.4	227 02.4	N 6 12.8	356 09.2	S18 57.9	173 31.2	N19 54.1	180 47.3	N16 56.1
07	248 22.9	242 03.4	13.8	11 10.3	58.2	188 33.5	54.1	195 49.7	56.1
M 08	263 25.3	257 04.4	14.9	26 11.4	58.5	203 35.8	54.1	210 52.0	56.2
09	278 27.8	272 05.4 . .	15.9	41 12.5 . .	58.8	218 38.1 . .	54.2	225 54.4 . .	56.2
A 10	293 30.3	287 06.4	17.0	56 13.6	59.1	233 40.4	54.2	240 56.8	56.2
R 11	308 32.7	302 07.4	18.0	71 14.7	59.5	248 42.7	54.3	255 59.2	56.3
T 12	323 35.2	317 08.4	N 6 19.1	86 15.8	S18 59.8	263 45.0	N19 54.3	271 01.5	N16 56.3
E 13	338 37.6	332 09.4	20.1	101 16.9	19 00.1	278 47.3	54.3	286 03.9	56.3
14	353 40.1	347 10.4	21.2	116 18.1	00.4	293 49.6	54.4	301 06.3	56.4
S 15	8 42.6	2 11.5 . .	22.2	131 19.2 . .	00.7	308 51.9 . .	54.4	316 08.7 . .	56.4
16	23 45.0	17 12.5	23.3	146 20.3	01.0	323 54.2	54.5	331 11.0	56.4
17	38 47.5	32 13.5	24.3	161 21.4	01.3	338 56.5	54.5	346 13.4	56.5
18	53 50.0	47 14.5	N 6 25.3	176 22.5	S19 01.6	353 58.8	N19 54.6	1 15.8	N16 56.5
19	68 52.4	62 15.5	26.4	191 23.6	01.9	9 01.1	54.6	16 18.2	56.5
20	83 54.9	77 16.5	27.4	206 24.7	02.2	24 03.4	54.6	31 20.5	56.6
21	98 57.4	92 17.6 . .	28.5	221 25.8 . .	02.5	39 05.7 . .	54.7	46 22.9 . .	56.6
22	113 59.8	107 18.6	29.5	236 26.9	02.8	54 08.0	54.7	61 25.3	56.6
23	129 02.3	122 19.6	30.5	251 28.0	03.1	69 10.3	54.8	76 27.7	56.7
14 00	144 04.8	137 20.7	N 6 31.6	266 29.1	S19 03.4	84 12.6	N19 54.8	91 30.0	N16 56.7
01	159 07.2	152 21.7	32.6	281 30.3	03.7	99 14.9	54.8	106 32.4	56.7
02	174 09.7	167 22.7	33.7	296 31.4	04.0	114 17.1	54.9	121 34.8	56.8
03	189 12.1	182 23.8 . .	34.7	311 32.5 . .	04.3	129 19.4 . .	54.9	136 37.2 . .	56.8
04	204 14.6	197 24.8	35.7	326 33.6	04.6	144 21.7	55.0	151 39.5	56.8
05	219 17.1	212 25.8	36.8	341 34.7	04.9	159 24.0	55.0	166 41.9	56.9
06	234 19.5	227 26.9	N 6 37.8	356 35.8	S19 05.2	174 26.3	N19 55.1	181 44.3	N16 56.9
07	249 22.0	242 27.9	38.8	11 36.9	05.5	189 28.6	55.1	196 46.6	56.9
M 08	264 24.5	257 29.0	39.9	26 38.0	05.8	204 30.9	55.1	211 49.0	57.0
I 09	279 26.9	272 30.0 . .	40.9	41 39.1 . .	06.1	219 33.2 . .	55.2	226 51.4 . .	57.0
E 10	294 29.4	287 31.0	41.9	56 40.2	06.4	234 35.5	55.2	241 53.8	57.0
R 11	309 31.9	302 32.1	43.0	71 41.4	06.7	249 37.8	55.3	256 56.1	57.1
C 12	324 34.3	317 33.1	N 6 44.0	86 42.5	S19 07.0	264 40.1	N19 55.3	271 58.5	N16 57.1
O 13	339 36.8	332 34.2	45.0	101 43.6	07.3	279 42.4	55.4	287 00.9	57.1
L 14	354 39.3	347 35.3	46.0	116 44.7	07.6	294 44.7	55.4	302 03.2	57.2
E 15	9 41.7	2 36.3 . .	47.1	131 45.8 . .	07.9	309 47.0 . .	55.4	317 05.6 . .	57.2
S 16	24 44.2	17 37.4	48.1	146 46.9	08.2	324 49.3	55.5	332 08.0	57.2
17	39 46.6	32 38.4	49.1	161 48.0	08.5	339 51.6	55.5	347 10.4	57.3
18	54 49.1	47 39.5	N 6 50.1	176 49.1	S19 08.8	354 53.8	N19 55.6	2 12.7	N16 57.3
19	69 51.6	62 40.6	51.2	191 50.3	09.1	9 56.1	55.6	17 15.1	57.3
20	84 54.0	77 41.6	52.2	206 51.4	09.4	24 58.4	55.7	32 17.5	57.4
21	99 56.5	92 42.7 . .	53.2	221 52.5 . .	09.7	40 00.7 . .	55.7	47 19.8 . .	57.4
22	114 59.0	107 43.8	54.2	236 53.6	10.0	55 03.0	55.7	62 22.2	57.5
23	130 01.4	122 44.8	55.3	251 54.7	10.3	70 05.3	55.8	77 24.6	57.5
Pas. Mer.	h m 14 25.3	*v* 1.0	*d* 1.0	*v* 1.1	*d* 0.3	*v* 2.3	*d* 0.0	*v* 2.4	*d* 0.0

ESTRELLAS		
Nombre	A.H.S.	Dec.
	° ′	° ′
Acamar	315 25.7	S40 18.4
Achernar	335 34.2	S57 14.3
Acrux	173 19.7	S63 06.1
Adhara	255 19.8	S28 58.6
Aldebaran	291 00.4	N16 30.6
Alioth	166 28.7	N55 57.1
Alkaid	153 06.2	N49 18.3
Al Na'ir	27 56.2	S46 57.5
Alnilam	275 56.0	S 1 12.2
Alphard	218 05.3	S 8 39.9
Alphecca	126 19.2	N26 42.5
Alpheratz	357 53.8	N29 05.7
Altair	62 18.0	N 8 52.1
Ankaa	353 25.5	S42 18.3
Antares	112 38.2	S26 26.0
Arcturus	146 04.4	N19 10.5
Atria	107 49.0	S69 01.5
Avior	234 21.4	S59 30.9
Bellatrix	278 42.2	N 6 20.9
Betelgeuse	271 11.6	N 7 24.3
Canopus	264 00.1	S52 42.1
Capella	280 48.5	N46 00.0
Deneb	49 38.5	N45 16.9
Denebola	182 43.2	N14 33.9
Diphda	349 05.8	S17 59.1
Dubhe	194 02.8	N61 44.6
Elnath	278 24.7	N28 36.5
Eltanin	90 50.9	N51 29.1
Enif	33 56.9	N 9 52.6
Fomalhaut	15 34.9	S29 37.2
Gacrux	172 11.4	S57 06.9
Gienah	176 02.0	S17 32.8
Hadar	149 01.5	S60 22.4
Hamal	328 11.8	N23 28.0
Kaus Aust.	83 56.9	S34 23.0
Kochab	137 19.3	N74 08.8
Markab	13 48.3	N15 12.5
Menkar	314 25.2	N 4 05.5
Menkent	148 18.9	S36 22.3
Miaplacidus	221 40.9	S69 43.3
Mirfak	308 54.3	N49 52.0
Nunki	76 10.6	S26 17.7
Peacock	53 34.9	S56 43.9
Pollux	243 39.2	N28 01.4
Procyon	245 09.6	N 5 13.2
Rasalhague	96 15.6	N12 33.4
Regulus	207 53.5	N11 57.7
Rigel	281 21.2	S 8 12.2
Rigil Kent.	140 05.0	S60 50.0
Sabik	102 23.8	S15 43.5
Schedar	349 52.0	N56 32.6
Shaula	96 35.3	S37 06.2
Sirius	258 42.0	S16 43.2
Spica	158 41.3	S11 10.0
Suhail	222 59.1	S43 26.3
Vega	80 45.8	N38 46.9
Zuben'ubi	137 16.1	S16 02.7

	A.H.S.	Pas. Mer.
	° ′	h m
Venus	353 50.8	14 51
Marte	122 56.9	6 15
Júpiter	300 11.7	18 24
Saturno	307 27.4	17 55

T.U.	SOL A.H.G.	SOL Dec.	LUNA A.H.G.	LUNA v	LUNA Dec.	LUNA d	LUNA P.H.
d h	° ′	° ′	° ′	′	° ′	′	′
12 00	176 26.6	S13 44.5	306 45.0	11.0	S 0 56.0	13.5	59.0
01	191 26.6	43.6	321 15.0	11.0	1 09.5	13.5	59.0
02	206 26.7	42.8	335 45.0	11.1	1 23.0	13.5	59.0
03	221 26.7	42.0	350 15.1	11.2	1 36.5	13.4	58.9
04	236 26.7	41.1	4 45.3	11.2	1 49.9	13.4	58.9
05	251 26.7	40.3	19 15.5	11.2	2 03.3	13.4	58.8
06	266 26.7	S13 39.5	33 45.7	11.2	S 2 16.7	13.4	58.8
07	281 26.7	38.6	48 15.9	11.3	2 30.1	13.3	58.8
08	296 26.7	37.8	62 46.2	11.3	2 43.4	13.2	58.7
L 09	311 26.7	37.0	77 16.5	11.4	2 56.6	13.3	58.7
U 10	326 26.7	36.1	91 46.9	11.4	3 09.9	13.2	58.6
11	341 26.7	35.3	106 17.3	11.4	3 23.1	13.2	58.6
N 12	356 26.7	S13 34.5	120 47.7	11.5	S 3 36.3	13.1	58.6
E 13	11 26.8	33.6	135 18.2	11.5	3 49.4	13.1	58.5
14	26 26.8	32.8	149 48.7	11.5	4 02.5	13.1	58.5
S 15	41 26.8	32.0	164 19.2	11.5	4 15.6	13.0	58.4
16	56 26.8	31.1	178 49.7	11.6	4 28.6	12.9	58.4
17	71 26.8	30.3	193 20.3	11.6	4 41.5	13.0	58.4
18	86 26.8	S13 29.5	207 50.9	11.6	S 4 54.5	12.9	58.3
19	101 26.8	28.6	222 21.5	11.7	5 07.4	12.8	58.3
20	116 26.8	27.8	236 52.2	11.7	5 20.2	12.8	58.2
21	131 26.9	26.9	251 22.9	11.7	5 33.0	12.7	58.2
22	146 26.9	26.1	265 53.6	11.7	5 45.7	12.7	58.2
23	161 26.9	25.3	280 24.3	11.8	5 58.4	12.7	58.1
13 00	176 26.9	S13 24.4	294 55.1	11.7	S 6 11.1	12.6	58.1
01	191 26.9	23.6	309 25.8	11.8	6 23.7	12.5	58.0
02	206 26.9	22.7	323 56.6	11.8	6 36.2	12.5	58.0
03	221 26.9	21.9	338 27.4	11.9	6 48.7	12.5	57.9
04	236 27.0	21.1	352 58.3	11.8	7 01.2	12.4	57.9
05	251 27.0	20.2	7 29.1	11.9	7 13.6	12.3	57.9
06	266 27.0	S13 19.4	22 00.0	11.8	S 7 25.9	12.3	57.8
07	281 27.0	18.5	36 30.8	11.9	7 38.2	12.2	57.8
M 08	296 27.0	17.7	51 01.7	12.0	7 50.4	12.2	57.7
A 09	311 27.0	16.9	65 32.7	11.9	8 02.6	12.1	57.7
R 10	326 27.1	16.0	80 03.6	11.9	8 14.7	12.1	57.7
T 11	341 27.1	15.2	94 34.5	12.0	8 26.8	12.0	57.6
E 12	356 27.1	S13 14.3	109 05.5	11.9	S 8 38.8	11.9	57.6
13	11 27.1	13.5	123 36.4	12.0	8 50.7	11.9	57.5
S 14	26 27.1	12.6	138 07.4	12.0	9 02.6	11.8	57.5
15	41 27.1	11.8	152 38.4	12.0	9 14.4	11.7	57.5
16	56 27.2	10.9	167 09.4	12.0	9 26.1	11.7	57.4
17	71 27.2	10.1	181 40.4	12.0	9 37.8	11.6	57.4
18	86 27.2	S13 09.3	196 11.4	12.0	S 9 49.4	11.6	57.3
19	101 27.2	08.4	210 42.4	12.1	10 01.0	11.5	57.3
20	116 27.2	07.6	225 13.5	12.0	10 12.5	11.4	57.3
21	131 27.3	06.7	239 44.5	12.0	10 23.9	11.4	57.2
22	146 27.3	05.9	254 15.5	12.1	10 35.3	11.3	57.2
23	161 27.3	05.0	268 46.6	12.0	10 46.6	11.2	57.2
14 00	176 27.3	S13 04.2	283 17.6	12.1	S10 57.8	11.2	57.1
01	191 27.3	03.3	297 48.7	12.0	11 09.0	11.0	57.1
02	206 27.4	02.5	312 19.7	12.1	11 20.0	11.1	57.0
03	221 27.4	01.6	326 50.8	12.1	11 31.1	10.9	57.0
04	236 27.4	13 00.8	341 21.9	12.0	11 42.0	10.9	57.0
05	251 27.4	12 59.9	355 52.9	12.1	11 52.9	10.8	56.9
06	266 27.5	S12 59.1	10 24.0	12.0	S12 03.7	10.7	56.9
M 07	281 27.5	58.2	24 55.0	12.1	12 14.4	10.7	56.9
I 08	296 27.5	57.4	39 26.1	12.1	12 25.1	10.5	56.8
E 09	311 27.5	56.5	53 57.2	12.0	12 35.6	10.5	56.8
R 10	326 27.6	55.7	68 28.2	12.1	12 46.1	10.5	56.7
C 11	341 27.6	54.8	82 59.3	12.0	12 56.6	10.3	56.7
O 12	356 27.6	S12 54.0	97 30.3	12.1	S13 06.9	10.3	56.7
L 13	11 27.6	53.1	112 01.4	12.0	13 17.2	10.2	56.6
E 14	26 27.7	52.3	126 32.4	12.1	13 27.4	10.1	56.6
S 15	41 27.7	51.4	141 03.5	12.0	13 37.5	10.1	56.6
16	56 27.7	50.5	155 34.5	12.1	13 47.6	9.9	56.5
17	71 27.7	49.7	170 05.6	12.0	13 57.5	9.9	56.5
18	86 27.8	S12 48.8	184 36.6	12.0	S14 07.4	9.8	56.5
19	101 27.8	48.0	199 07.6	12.0	14 17.2	9.7	56.4
20	116 27.8	47.1	213 38.6	12.0	14 26.9	9.7	56.4
21	131 27.9	46.3	228 09.6	12.1	14 36.6	9.5	56.4
22	146 27.9	45.4	242 40.7	11.9	14 46.1	9.5	56.3
23	161 27.9	44.6	257 11.6	12.0	S14 55.6	9.4	56.3
	SD 16.2	d 0.8	SD 16.0		15.7		15.4

Lat.	Crepúsculo Nautico	Crepúsculo Civil	Orto Sol	Orto Luna 12	Orto Luna 13	Orto Luna 14	Orto Luna 15
°	h m	h m	h m	h m	h m	h m	h m
N 72	06 23	07 44	09 05	23 38	25 44	01 44	04 04
N 70	06 20	07 33	08 43	23 29	25 23	01 23	03 22
68	06 18	07 24	08 26	23 21	25 08	01 08	02 54
66	06 16	07 16	08 13	23 15	24 55	00 55	02 33
64	06 14	07 10	08 01	23 10	24 44	00 44	02 17
62	06 12	07 04	07 52	23 05	24 36	00 36	02 03
60	06 10	06 59	07 43	23 01	24 28	00 28	01 52
N 58	06 09	06 55	07 36	22 58	24 21	00 21	01 42
56	06 07	06 51	07 30	22 55	24 15	00 15	01 33
54	06 06	06 47	07 24	22 52	24 10	00 10	01 25
52	06 04	06 44	07 19	22 50	24 05	00 05	01 18
50	06 03	06 41	07 14	22 47	24 01	00 01	01 12
45	05 59	06 34	07 04	22 42	23 52	24 59	00 59
N 40	05 56	06 28	06 55	22 38	23 44	24 48	00 48
35	05 52	06 22	06 48	22 35	23 38	24 39	00 39
30	05 49	06 17	06 42	22 32	23 32	24 31	00 31
20	05 42	06 08	06 30	22 26	23 22	24 17	00 17
N 10	05 34	05 59	06 20	22 22	23 14	24 05	00 05
0	05 25	05 50	06 11	22 18	23 06	23 53	24 42
S 10	05 14	05 39	06 01	22 13	22 58	23 42	24 28
20	05 01	05 28	05 51	22 09	22 49	23 30	24 13
30	04 44	05 14	05 39	22 04	22 40	23 17	23 56
35	04 33	05 05	05 32	22 01	22 34	23 09	23 46
40	04 20	04 55	05 24	21 58	22 28	23 00	23 35
45	04 04	04 43	05 14	21 54	22 21	22 50	23 22
S 50	03 42	04 27	05 03	21 50	22 13	22 38	23 06
52	03 32	04 20	04 58	21 47	22 09	22 32	22 59
54	03 20	04 12	04 52	21 45	22 04	22 25	22 50
56	03 05	04 02	04 45	21 43	22 00	22 18	22 41
58	02 48	03 52	04 38	21 40	21 54	22 11	22 31
S 60	02 26	03 39	04 30	21 37	21 48	22 02	22 19

Lat.	Ocaso Sol	Crepúsculo Civil	Crepúsculo Náutico	Ocaso Luna 12	Ocaso Luna 13	Ocaso Luna 14	Ocaso Luna 15
°	h m	h m	h m	h m	h m	h m	h m
N 72	15 25	16 47	18 08	09 12	08 53	08 29	07 49
N 70	15 47	16 57	18 10	09 17	09 05	08 51	08 32
68	16 04	17 06	18 12	09 20	09 14	09 08	09 01
66	16 17	17 14	18 14	09 23	09 22	09 22	09 23
64	16 28	17 20	18 16	09 25	09 29	09 34	09 41
62	16 38	17 25	18 18	09 28	09 35	09 44	09 55
60	16 46	17 30	18 19	09 29	09 40	09 53	10 07
N 58	16 53	17 35	18 21	09 31	09 45	10 00	10 18
56	16 59	17 39	18 22	09 33	09 49	10 07	10 27
54	17 05	17 42	18 24	09 34	09 53	10 13	10 36
52	17 10	17 45	18 25	09 35	09 56	10 18	10 43
50	17 15	17 49	18 27	09 36	09 59	10 23	10 50
45	17 25	17 55	18 30	09 39	10 06	10 34	11 04
N 40	17 33	18 01	18 33	09 41	10 11	10 43	11 16
35	17 41	18 07	18 36	09 43	10 16	10 50	11 26
30	17 47	18 12	18 40	09 45	10 20	10 57	11 35
20	17 58	18 21	18 47	09 47	10 28	11 09	11 50
N 10	18 08	18 30	18 55	09 50	10 34	11 19	12 04
0	18 18	18 39	19 03	09 52	10 41	11 28	12 16
S 10	18 27	18 49	19 14	09 54	10 47	11 38	12 29
20	18 37	19 00	19 27	09 57	10 53	11 48	12 43
30	18 49	19 14	19 44	10 00	11 01	12 00	12 58
35	18 56	19 23	19 55	10 01	11 05	12 07	13 07
40	19 04	19 33	20 07	10 03	11 10	12 15	13 18
45	19 13	19 45	20 24	10 05	11 16	12 24	13 30
S 50	19 24	20 00	20 44	10 07	11 23	12 35	13 45
52	19 30	20 07	20 55	10 09	11 26	12 40	13 52
54	19 35	20 15	21 07	10 10	11 29	12 46	14 00
56	19 42	20 24	21 21	10 11	11 33	12 53	14 09
58	19 49	20 35	21 38	10 13	11 38	13 00	14 18
S 60	19 57	20 47	21 59	10 15	11 43	13 08	14 30

Día	SOL E.T. (−) 00h	SOL E.T. (−) 12h	SOL Pas. Mer.	LUNA Pas. Sup.	LUNA Mer. Inf.	LUNA Edad	LUNA Fase
d	m s	m s	h m	h m	h m	d %	
12	14 13	14 13	12 14	03 40	16 05	19 77	
13	14 12	14 12	12 14	04 29	16 53	20 67	
14	14 11	14 10	12 14	05 17	17 41	21 57	

T.U.	ARIES	VENUS −4.6		MARTE +0.7		JUPITER −2.4		SATURNO +0.2	
d h	A.H.G.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.
	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
15 00	145 03.9	137 45.9	N 6 56.3	266 55.8	S19 10.6	85 07.6	N19 55.8	92 26.9	N16 57.5
01	160 06.4	152 47.0	57.3	281 56.9	10.9	100 09.9	55.9	107 29.3	57.6
02	175 08.8	167 48.1	58.3	296 58.0	11.2	115 12.2	55.9	122 31.7	57.6
03	190 11.3	182 49.1	6 59.4	311 59.2	11.5	130 14.5	56.0	137 34.0	57.6
04	205 13.7	197 50.2	7 00.4	327 00.3	11.8	145 16.7	56.0	152 36.4	57.7
05	220 16.2	212 51.3	01.4	342 01.4	12.1	160 19.0	56.0	167 38.8	57.7
06	235 18.7	227 52.4	N 7 02.4	357 02.5	S19 12.4	175 21.3	N19 56.1	182 41.1	N16 57.7
07	250 21.1	242 53.5	03.4	12 03.6	12.7	190 23.6	56.1	197 43.5	57.8
J 08	265 23.6	257 54.6	04.4	27 04.7	13.0	205 25.9	56.2	212 45.9	57.8
U 09	280 26.1	272 55.7	05.5	42 05.8	13.2	220 28.2	56.2	227 48.2	57.8
E 10	295 28.5	287 56.8	06.5	57 07.0	13.5	235 30.5	56.3	242 50.6	57.9
V 11	310 31.0	302 57.9	07.5	72 08.1	13.8	250 32.7	56.3	257 53.0	57.9
E 12	325 33.5	317 59.0	N 7 08.5	87 09.2	S19 14.1	265 35.0	N19 56.3	272 55.3	N16 57.9
S 13	340 35.9	333 00.1	09.5	102 10.3	14.4	280 37.3	56.4	287 57.7	58.0
14	355 38.4	348 01.2	10.5	117 11.4	14.7	295 39.6	56.4	303 00.1	58.0
15	10 40.9	3 02.3	11.5	132 12.5	15.0	310 41.9	56.5	318 02.4	58.0
16	25 43.3	18 03.4	12.5	147 13.6	15.3	325 44.2	56.5	333 04.8	58.1
17	40 45.8	33 04.5	13.6	162 14.8	15.6	340 46.5	56.6	348 07.2	58.1
18	55 48.2	48 05.6	N 7 14.6	177 15.9	S19 15.9	355 48.7	N19 56.6	3 09.5	N16 58.2
19	70 50.7	63 06.7	15.6	192 17.0	16.2	10 51.0	56.7	18 11.9	58.2
20	85 53.2	78 07.8	16.6	207 18.1	16.5	25 53.3	56.7	33 14.3	58.2
21	100 55.6	93 08.9	17.6	222 19.2	16.8	40 55.6	56.7	48 16.6	58.3
22	115 58.1	108 10.0	18.6	237 20.3	17.1	55 57.9	56.8	63 19.0	58.3
23	131 00.6	123 11.2	19.6	252 21.5	17.4	71 00.1	56.8	78 21.4	58.3
16 00	146 03.0	138 12.3	N 7 20.6	267 22.6	S19 17.7	86 02.4	N19 56.9	93 23.7	N16 58.4
01	161 05.5	153 13.4	21.6	282 23.7	17.9	101 04.7	56.9	108 26.1	58.4
02	176 08.0	168 14.5	22.6	297 24.8	18.2	116 07.0	57.0	123 28.5	58.4
03	191 10.4	183 15.6	23.6	312 25.9	18.5	131 09.3	57.0	138 30.8	58.5
04	206 12.9	198 17.8	24.6	327 27.0	18.8	146 11.6	57.1	153 33.2	58.5
05	221 15.4	213 17.9	25.6	342 28.2	19.1	161 13.8	57.1	168 35.6	58.5
06	236 17.8	228 19.0	N 7 26.6	357 29.3	S19 19.4	176 16.1	N19 57.2	183 37.9	N16 58.6
07	251 20.3	243 20.2	27.6	12 30.4	19.7	191 18.4	57.2	198 40.3	58.6
08	266 22.7	258 21.3	28.6	27 31.5	20.0	206 20.7	57.2	213 42.6	58.7
V 09	281 25.2	273 22.5	29.6	42 32.6	20.3	221 22.9	57.3	228 45.0	58.7
I 10	296 27.7	288 23.6	30.6	57 33.8	20.6	236 25.2	57.3	243 47.4	58.7
E 11	311 30.1	303 24.7	31.6	72 34.9	20.9	251 27.5	57.4	258 49.7	58.8
R 12	326 32.6	318 25.9	N 7 32.6	87 36.0	S19 21.2	266 29.8	N19 57.4	273 52.1	N16 58.8
N 13	341 35.1	333 27.0	33.6	102 37.1	21.4	281 32.1	57.5	288 54.5	58.8
E 14	356 37.5	348 28.2	34.6	117 38.2	21.7	296 34.3	57.5	303 56.8	58.9
S 15	11 40.0	3 29.3	35.6	132 39.3	22.0	311 36.6	57.6	318 59.2	58.9
16	26 42.5	18 30.5	36.6	147 40.5	22.3	326 38.9	57.6	334 01.5	58.9
17	41 44.9	33 31.6	37.6	162 41.6	22.6	341 41.2	57.6	349 03.9	59.0
18	56 47.4	48 32.8	N 7 38.6	177 42.7	S19 22.9	356 43.4	N19 57.7	4 06.3	N16 59.0
19	71 49.9	63 34.0	39.5	192 43.8	23.2	11 45.7	57.7	19 08.6	59.0
20	86 52.3	78 35.1	40.5	207 44.9	23.5	26 48.0	57.8	34 11.0	59.1
21	101 54.8	93 36.3	41.5	222 46.1	23.8	41 50.3	57.8	49 13.3	59.1
22	116 57.2	108 37.4	42.5	237 47.2	24.0	56 52.5	57.9	64 15.7	59.2
23	131 59.7	123 38.6	43.5	252 48.3	24.3	71 54.8	57.9	79 18.1	59.2
17 00	147 02.2	138 39.8	N 7 44.5	267 49.4	S19 24.6	86 57.1	N19 58.0	94 20.4	N16 59.2
01	162 04.6	153 41.0	45.5	282 50.5	24.9	101 59.4	58.0	109 22.8	59.3
02	177 07.1	168 42.1	46.5	297 51.7	25.2	117 01.6	58.1	124 25.1	59.3
03	192 09.6	183 43.3	47.4	312 52.8	25.5	132 03.9	58.1	139 27.5	59.3
04	207 12.0	198 44.5	48.4	327 53.9	25.8	147 06.2	58.2	154 29.9	59.4
05	222 14.5	213 45.7	49.4	342 55.0	26.1	162 08.4	58.2	169 32.2	59.4
06	237 17.0	228 46.8	N 7 50.4	357 56.1	S19 26.3	177 10.7	N19 58.2	184 34.6	N16 59.5
07	252 19.4	243 48.0	51.4	12 57.3	26.6	192 13.0	58.3	199 36.9	59.5
S 08	267 21.9	258 49.2	52.3	27 58.4	26.9	207 15.3	58.3	214 39.3	59.5
A 09	282 24.3	273 50.4	53.3	42 59.5	27.2	222 17.5	58.4	229 41.6	59.6
B 10	297 26.8	288 51.6	54.3	58 00.6	27.5	237 19.8	58.4	244 44.0	59.6
A 11	312 29.3	303 52.8	55.3	73 01.8	27.8	252 22.1	58.5	259 46.4	59.6
D 12	327 31.7	318 54.0	N 7 56.3	88 02.9	S19 28.1	267 24.3	N19 58.5	274 48.7	N16 59.7
O 13	342 34.2	333 55.2	57.2	103 04.0	28.3	282 26.6	58.6	289 51.1	59.7
14	357 36.7	348 56.4	58.2	118 05.1	28.6	297 28.9	58.6	304 53.4	59.7
15	12 39.1	3 57.6	7 59.2	133 06.2	28.9	312 31.1	58.7	319 55.8	59.8
16	27 41.6	18 58.8	8 00.2	148 07.4	29.2	327 33.4	58.7	334 58.2	59.8
17	42 44.1	34 00.0	01.1	163 08.5	29.5	342 35.7	58.8	350 00.5	59.9
18	57 46.5	49 01.2	N 8 02.1	178 09.6	S19 29.8	357 37.9	N19 58.8	5 02.9	N16 59.9
19	72 49.0	64 02.4	03.1	193 10.7	30.1	12 40.2	58.9	20 05.2	16 59.9
20	87 51.5	79 03.6	04.0	208 11.9	30.3	27 42.5	58.9	35 07.6	17 00.0
21	102 53.9	94 04.8	05.0	223 13.0	30.6	42 44.7	59.0	50 09.9	00.0
22	117 56.4	109 06.0	06.0	238 14.1	30.9	57 47.0	59.0	65 12.3	00.0
23	132 58.8	124 07.3	06.9	253 15.2	31.2	72 49.3	59.0	80 14.6	00.1
	h m								
Pas. Mer.	14 13.5	v 1.1	d 1.0	v 1.1	d 0.3	v 2.3	d 0.0	v 2.4	d 0.0

ESTRELLAS

Nombre	A.H.S	Dec.
	° ′	° ′
Acamar	315 25.7	S40 18.4
Achernar	335 34.2	S57 14.3
Acrux	173 19.7	S63 06.1
Adhara	255 19.8	S28 58.6
Aldebaran	291 00.4	N16 30.6
Alioth	166 28.7	N55 57.1
Alkaid	153 06.2	N49 18.3
Al Na'ir	27 56.2	S46 57.5
Alnilam	275 56.0	S 1 12.2
Alphard	218 05.3	S 8 39.9
Alphecca	126 19.2	N26 42.5
Alpheratz	357 53.8	N29 05.7
Altair	62 17.9	N 8 52.1
Ankaa	353 25.5	S42 18.3
Antares	112 38.2	S26 26.0
Arcturus	146 04.4	N19 10.5
Atria	107 49.0	S69 01.5
Avior	234 21.4	S59 30.9
Bellatrix	278 42.2	N 6 20.9
Betelgeuse	271 11.6	N 7 24.3
Canopus	264 00.1	S52 42.1
Capella	280 48.6	N46 00.0
Deneb	49 38.5	N45 16.9
Denebola	182 43.2	N14 33.9
Diphda	349 05.8	S17 59.1
Dubhe	194 02.7	N61 44.6
Elnath	278 24.7	N28 36.5
Eltanin	90 50.9	N51 29.1
Enif	33 56.9	N 9 52.6
Fomalhaut	15 34.9	S29 37.2
Gacrux	172 11.3	S57 06.9
Gienah	176 02.0	S17 32.8
Hadar	149 01.5	S60 22.4
Hamal	328 11.8	N23 28.0
Kaus Aust.	83 56.9	S34 23.0
Kochab	137 19.3	N74 08.8
Markab	13 48.3	N15 12.5
Menkar	314 25.2	N 4 05.5
Menkent	148 18.9	S36 22.3
Miaplacidus	221 40.9	S69 43.3
Mirfak	308 54.3	N49 52.0
Nunki	76 10.5	S26 17.7
Peacock	53 34.9	S56 43.9
Pollux	243 39.2	N28 01.4
Procyon	245 09.6	N 5 13.2
Rasalhague	96 15.6	N12 33.4
Regulus	207 53.4	N11 57.7
Rigel	281 21.2	S 8 12.2
Rigil Kent.	140 04.9	S60 50.1
Sabik	102 23.8	S15 43.5
Schedar	349 52.1	N56 32.6
Shaula	96 35.2	S37 06.1
Sirius	258 42.0	S16 43.2
Spica	158 41.3	S11 10.0
Suhail	222 59.1	S43 26.3
Vega	80 45.8	N38 46.9
Zuben'ubi	137 16.1	S16 02.7

	A.H.S	Pas. Mer.
	° ′	h m
Venus	352 09.2	14 46
Marte	121 19.5	6 10
Júpiter	299 59.4	18 13
Saturno	307 20.7	17 44

T.U.	SOL				LUNA						
	A.H.G.		Dec.		A.H.G.	v	Dec.	d	P.H.		
d h	° ′		° ′		° ′	′	° ′	′	′		
15 00	176 27.9		S12 43.7		271 42.6	12.0	S15 05.0	9.3	56.2		
01	191 28.0		42.8		286 13.6	12.0	15 14.3	9.2	56.2		
02	206 28.0		42.0		300 44.6	12.0	15 23.5	9.2	56.2		
03	221 28.0	. .	41.1		315 15.6	11.9	15 32.7	9.0	56.1		
04	236 28.1		40.3		329 46.5	12.0	15 41.7	9.0	56.1		
05	251 28.1		39.4		344 17.5	11.9	15 50.7	8.9	56.1		
06	266 28.1		S12 38.6		358 48.4	11.9	S15 59.6	8.8	56.0		
07	281 28.2		37.7		13 19.3	11.9	16 08.4	8.7	56.0		
08	296 28.2		36.8		27 50.2	11.9	16 17.1	8.6	56.0		
J 09	311 28.2	. .	36.0		42 21.1	11.9	16 25.7	8.6	56.0		
U 10	326 28.2		35.1		56 52.0	11.9	16 34.3	8.4	55.9		
E 11	341 28.3		34.2		71 22.9	11.9	16 42.7	8.4	55.9		
V 12	356 28.3		S12 33.4		85 53.8	11.8	S16 51.1	8.2	55.9		
E 13	11 28.3		32.5		100 24.6	11.9	16 59.3	8.2	55.8		
S 14	26 28.4		31.7		114 55.5	11.8	17 07.5	8.1	55.8		
15	41 28.4	. .	30.8		129 26.3	11.8	17 15.6	8.0	55.8		
16	56 28.4		29.9		143 57.1	11.8	17 23.6	7.9	55.7		
17	71 28.5		29.1		158 27.9	11.8	17 31.5	7.8	55.7		
18	86 28.5		S12 28.2		172 58.7	11.8	S17 39.3	7.7	55.7		
19	101 28.6		27.3		187 29.5	11.8	17 47.0	7.6	55.6		
20	116 28.6		26.5		202 00.3	11.7	17 54.6	7.6	55.6		
21	131 28.6	. .	25.6		216 31.0	11.8	18 02.2	7.4	55.6		
22	146 28.7		24.8		231 01.8	11.7	18 09.6	7.3	55.6		
23	161 28.7		23.9		245 32.5	11.7	18 16.9	7.3	55.5		
16 00	176 28.7		S12 23.0		260 03.2	11.7	S18 24.2	7.1	55.5		
01	191 28.8		22.2		274 33.9	11.7	18 31.3	7.1	55.5		
02	206 28.8		21.3		289 04.6	11.7	18 38.4	7.0	55.5		
03	221 28.8	. .	20.4		303 35.3	11.7	18 45.4	6.8	55.4		
04	236 28.9		19.6		318 06.0	11.6	18 52.2	6.8	55.4		
05	251 28.9		18.7		332 36.6	11.7	18 59.0	6.7	55.4		
06	266 29.0		S12 17.8		347 07.3	11.6	S19 05.7	6.5	55.3		
07	281 29.0		17.0		1 37.9	11.6	19 12.2	6.5	55.3		
V 08	296 29.0		16.1		16 08.5	11.6	19 18.7	6.4	55.3		
I 09	311 29.1	. .	15.2		30 39.1	11.6	19 25.1	6.3	55.3		
E 10	326 29.1		14.3		45 09.7	11.6	19 31.4	6.2	55.2		
R 11	341 29.2		13.5		59 40.3	11.5	19 37.6	6.1	55.2		
N 12	356 29.2		S12 12.6		74 10.8	11.6	S19 43.7	5.9	55.2		
E 13	11 29.2		11.7		88 41.4	11.5	19 49.6	5.9	55.2		
S 14	26 29.3		10.9		103 11.9	11.5	19 55.5	5.8	55.1		
15	41 29.3	. .	10.0		117 42.4	11.5	20 01.3	5.7	55.1		
16	56 29.4		09.1		132 12.9	11.5	20 07.0	5.6	55.1		
17	71 29.4		08.3		146 43.4	11.5	20 12.6	5.5	55.1		
18	86 29.4		S12 07.4		161 13.9	11.5	S20 18.1	5.3	55.0		
19	101 29.5		06.5		175 44.4	11.4	20 23.4	5.3	55.0		
20	116 29.5		05.6		190 14.8	11.5	20 28.7	5.2	55.0		
21	131 29.6	. .	04.8		204 45.3	11.4	20 33.9	5.1	55.0		
22	146 29.6		03.9		219 15.7	11.4	20 39.0	5.0	55.0		
23	161 29.7		03.0		233 46.1	11.5	20 44.0	4.8	54.9		
17 00	176 29.7		S12 02.1		248 16.6	11.4	S20 48.8	4.8	54.9		
01	191 29.7		01.3		262 47.0	11.4	20 53.6	4.7	54.9		
02	206 29.8		12 00.4		277 17.4	11.3	20 58.3	4.5	54.9		
03	221 29.8		11 59.5		291 47.7	11.4	21 02.8	4.5	54.8		
04	236 29.9		58.6		306 18.1	11.4	21 07.3	4.3	54.8		
05	251 29.9		57.8		320 48.5	11.3	21 11.6	4.3	54.8		
06	266 30.0		S11 56.9		335 18.8	11.4	S21 15.9	4.1	54.8		
07	281 30.0		56.0		349 49.2	11.3	21 20.0	4.1	54.8		
S 08	296 30.1		55.1		4 19.5	11.3	21 24.1	3.9	54.7		
A 09	311 30.1	. .	54.3		18 49.8	11.3	21 28.0	3.8	54.7		
B 10	326 30.1		53.4		33 20.1	11.3	21 31.8	3.8	54.7		
A 11	341 30.2		52.5		47 50.4	11.3	21 35.6	3.6	54.7		
D 12	356 30.2		S11 51.6		62 20.7	11.3	S21 39.2	3.5	54.7		
O 13	11 30.3		50.8		76 51.0	11.3	21 42.7	3.4	54.7		
14	26 30.3		49.9		91 21.3	11.3	21 46.1	3.3	54.6		
15	41 30.4	. .	49.0		105 51.6	11.3	21 49.4	3.2	54.6		
16	56 30.4		48.1		120 21.9	11.3	21 52.6	3.1	54.6		
17	71 30.5		47.2		134 52.2	11.2	21 55.7	3.0	54.6		
18	86 30.5		S11 46.4		149 22.4	11.3	S21 58.7	2.9	54.6		
19	101 30.6		45.5		163 52.7	11.2	22 01.6	2.7	54.5		
20	116 30.6		44.6		178 22.9	11.3	22 04.3	2.7	54.5		
21	131 30.7	. .	43.7		192 53.2	11.2	22 07.0	2.6	54.5		
22	146 30.7		42.8		207 23.4	11.3	22 09.6	2.4	54.5		
23	161 30.8		42.0		221 53.7	11.2	S22 12.0	2.4	54.5		
	SD 16.2		d 0.9		SD 15.2		15.0		14.9		

Lat.	Crepúsculo Náutico	Crepúsculo Civil	Orto Sol	Orto Luna 15	Orto Luna 16	Orto Luna 17	Orto Luna 18
°	h m	h m	h m	h m	h m	h m	h m
N 72	06 10	07 30	08 47	04 04	▬	▬	▬
N 70	06 09	07 20	08 29	03 22	05 42	▬	▬
68	06 08	07 13	08 14	02 54	04 44	06 45	▬
66	06 06	07 06	08 02	02 33	04 11	05 44	07 04
64	06 05	07 01	07 51	02 17	03 46	05 09	06 20
62	06 04	06 56	07 43	02 03	03 27	04 45	05 51
60	06 03	06 52	07 35	01 52	03 11	04 25	05 29
N 58	06 02	06 48	07 29	01 42	02 58	04 09	05 11
56	06 01	06 44	07 23	01 33	02 47	03 55	04 56
54	06 00	06 41	07 18	01 25	02 37	03 43	04 43
52	05 59	06 38	07 13	01 18	02 28	03 33	04 31
50	05 58	06 35	07 09	01 12	02 20	03 24	04 21
45	05 55	06 29	06 59	00 59	02 03	03 04	04 00
N 40	05 52	06 24	06 52	00 48	01 50	02 48	03 43
35	05 49	06 19	06 45	00 39	01 38	02 35	03 29
30	05 47	06 15	06 39	00 31	01 28	02 23	03 16
20	05 40	06 06	06 29	00 17	01 11	02 03	02 55
N 10	05 33	05 58	06 19	00 05	00 56	01 46	02 37
0	05 25	05 50	06 11	24 42	00 42	01 30	02 19
S 10	05 15	05 40	06 02	24 28	00 28	01 14	02 02
20	05 03	05 30	05 52	24 13	00 13	00 57	01 44
30	04 47	05 16	05 41	23 56	24 38	00 38	01 23
35	04 37	05 08	05 35	23 46	24 26	00 26	01 11
40	04 24	04 59	05 27	23 35	24 13	00 13	00 56
45	04 09	04 47	05 19	23 22	23 58	24 40	00 40
S 50	03 49	04 33	05 08	23 06	23 39	24 19	00 19
52	03 39	04 26	05 03	22 59	23 31	24 09	00 09
54	03 28	04 19	04 58	22 50	23 21	23 58	24 44
56	03 15	04 10	04 52	22 41	23 10	23 46	24 31
58	02 59	04 00	04 45	22 31	22 57	23 31	24 16
S 60	02 40	03 49	04 38	22 19	22 42	23 14	23 58

Lat.	Ocaso Sol	Crepúsculo Civil	Crepúsculo Náutico	Ocaso Luna 15	Ocaso Luna 16	Ocaso Luna 17	Ocaso Luna 18
°	h m	h m	h m	h m	h m	h m	h m
N 72	15 42	17 00	18 20	07 49	▬	▬	▬
N 70	16 01	17 09	18 21	08 32	07 54	▬	▬
68	16 16	17 17	18 22	09 01	08 52	08 33	▬
66	16 28	17 23	18 23	09 23	09 26	09 35	09 57
64	16 38	17 29	18 24	09 41	09 51	10 09	10 40
62	16 46	17 33	18 25	09 55	10 11	10 34	11 10
60	16 54	17 38	18 26	10 07	10 27	10 54	11 32
N 58	17 00	17 41	18 27	10 18	10 41	11 11	11 50
56	17 06	17 45	18 28	10 27	10 53	11 25	12 05
54	17 11	17 48	18 29	10 36	11 03	11 37	12 18
52	17 16	17 51	18 30	10 43	11 12	11 47	12 30
50	17 20	17 53	18 31	10 50	11 20	11 57	12 40
45	17 29	17 59	18 34	11 04	11 38	12 17	13 01
N 40	17 37	18 05	18 36	11 16	11 52	12 33	13 19
35	17 44	18 09	18 39	11 26	12 05	12 47	13 33
30	17 50	18 14	18 42	11 35	12 15	12 59	13 46
20	18 00	18 22	18 48	11 50	12 34	13 19	14 07
N 10	18 09	18 30	18 55	12 04	12 50	13 37	14 26
0	18 17	18 39	19 03	12 16	13 05	13 54	14 43
S 10	18 26	18 48	19 13	12 29	13 20	14 11	15 01
20	18 36	18 58	19 25	12 43	13 36	14 29	15 19
30	18 46	19 11	19 41	12 58	13 55	14 49	15 41
35	18 53	19 19	19 51	13 07	14 06	15 01	15 53
40	19 00	19 29	20 03	13 18	14 18	15 15	16 08
45	19 09	19 40	20 18	13 30	14 33	15 32	16 25
S 50	19 19	19 54	20 38	13 45	14 51	15 52	16 46
52	19 24	20 00	20 47	13 52	15 00	16 02	16 56
54	19 29	20 08	20 58	14 00	15 09	16 12	17 08
56	19 35	20 16	21 11	14 09	15 20	16 25	17 21
58	19 41	20 26	21 26	14 18	15 32	16 39	17 36
S 60	19 49	20 37	21 45	14 30	15 47	16 56	17 54

Día	SOL E. T. (−) 00h	SOL E. T. (−) 12h	SOL Pas. Mer.	LUNA Pas. Mer. Sup.	LUNA Pas. Mer. Inf.	LUNA Edad	LUNA Fase
d	m s	m s	h m	h m	h m	d	%
15	14 08	14 07	12 14	06 05	18 29	22	47
16	14 05	14 03	12 14	06 53	19 18	23	37
17	14 01	13 59	12 14	07 42	20 07	24	28

T.U.	ARIES	VENUS −4.6		MARTE +0.7		JUPITER −2.4		SATURNO +0.2	
d h	A.H.G.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.
	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
18 00	148 01.3	139 08.5	N 8 07.9	268 16.4	S19 31.5	87 51.5	N19 59.1	95 17.0	N17 00.1
01	163 03.8	154 09.7	08.9	283 17.5	31.8	102 53.8	59.1	110 19.4	00.2
02	178 06.2	169 10.9	09.8	298 18.6	32.0	117 56.1	59.2	125 21.7	00.2
03	193 08.7	184 12.1 . .	10.8	313 19.7 . .	32.3	132 58.3 . .	59.2	140 24.1 . .	00.2
04	208 11.2	199 13.4	11.8	328 20.9	32.6	148 00.6	59.3	155 26.4	00.3
05	223 13.6	214 14.6	12.7	343 22.0	32.9	163 02.9	59.3	170 28.8	00.3
06	238 16.1	229 15.8	N 8 13.7	358 23.1	S19 33.2	178 05.1	N19 59.4	185 31.1	N17 00.3
07	253 18.6	244 17.1	14.7	13 24.2	33.4	193 07.4	59.4	200 33.5	00.4
08	268 21.0	259 18.3	15.6	28 25.4	33.7	208 09.6	59.5	215 35.8	00.4
D 09	283 23.5	274 19.6 . .	16.6	43 26.5 . .	34.0	223 11.9 . .	59.5	230 38.2 . .	00.5
O 10	298 26.0	289 20.8	17.5	58 27.6	34.3	238 14.2	59.6	245 40.5	00.5
M 11	313 28.4	304 22.0	18.5	73 28.7	34.6	253 16.4	59.6	260 42.9	00.5
I 12	328 30.9	319 23.3	N 8 19.5	88 29.9	S19 34.9	268 18.7	N19 59.7	275 45.2	N17 00.6
N 13	343 33.3	334 24.5	20.4	103 31.0	35.1	283 21.0	59.7	290 47.6	00.6
G 14	358 35.8	349 25.8	21.4	118 32.1	35.4	298 23.2	59.8	305 50.0	00.7
O 15	13 38.3	4 27.0 . .	22.3	133 33.2 . .	35.7	313 25.5 . .	59.8	320 52.3 . .	00.7
16	28 40.7	19 28.3	23.3	148 34.4	36.0	328 27.7	59.9	335 54.7	00.7
17	43 43.2	34 29.5	24.2	163 35.5	36.3	343 30.0	19 59.9	350 57.0	00.8
18	58 45.7	49 30.8	N 8 25.2	178 36.6	S19 36.5	358 32.3	N20 00.0	5 59.4	N17 00.8
19	73 48.1	64 32.1	26.1	193 37.7	36.8	13 34.5	00.0	21 01.7	00.8
20	88 50.6	79 33.3	27.1	208 38.9	37.1	28 36.8	00.1	36 04.1	00.9
21	103 53.1	94 34.6 . .	28.0	223 40.0 . .	37.4	43 39.0 . .	00.1	51 06.4 . .	00.9
22	118 55.5	109 35.9	29.0	238 41.1	37.6	58 41.3	00.2	66 08.8	01.0
23	133 58.0	124 37.1	29.9	253 42.3	37.9	73 43.5	00.2	81 11.1	01.0
19 00	149 00.5	139 38.4	N 8 30.9	268 43.4	S19 38.2	88 45.8	N20 00.2	96 13.5	N17 01.0
01	164 02.9	154 39.7	31.8	283 44.5	38.5	103 48.1	00.3	111 15.8	01.1
02	179 05.4	169 41.0	32.8	298 45.6	38.8	118 50.3	00.3	126 18.2	01.1
03	194 07.8	184 42.2 . .	33.7	313 46.8 . .	39.0	133 52.6 . .	00.4	141 20.5 . .	01.2
04	209 10.3	199 43.5	34.7	328 47.9	39.3	148 54.8	00.4	156 22.9	01.2
05	224 12.8	214 44.8	35.6	343 49.0	39.6	163 57.1	00.5	171 25.2	01.2
06	239 15.2	229 46.1	N 8 36.5	358 50.2	S19 39.9	178 59.3	N20 00.5	186 27.6	N17 01.3
07	254 17.7	244 47.4	37.5	13 51.3	40.1	194 01.6	00.6	201 29.9	01.3
08	269 20.2	259 48.7	38.4	28 52.4	40.4	209 03.9	00.6	216 32.3	01.3
L 09	284 22.6	274 50.0 . .	39.4	43 53.6 . .	40.7	224 06.1 . .	00.7	231 34.6 . .	01.4
U 10	299 25.1	289 51.3	40.3	58 54.7	41.0	239 08.4	00.7	246 37.0	01.4
N 11	314 27.6	304 52.6	41.2	73 55.8	41.3	254 10.6	00.8	261 39.3	01.5
E 12	329 30.0	319 53.9	N 8 42.2	88 56.9	S19 41.5	269 12.9	N20 00.8	276 41.7	N17 01.5
S 13	344 32.5	334 55.2	43.1	103 58.1	41.8	284 15.1	00.9	291 44.0	01.5
14	359 34.9	349 56.5	44.0	118 59.2	42.1	299 17.4	00.9	306 46.4	01.6
15	14 37.4	4 57.8 . .	45.0	134 00.3 . .	42.4	314 19.6 . .	01.0	321 48.7 . .	01.6
16	29 39.9	19 59.1	45.9	149 01.5	42.6	329 21.9	01.0	336 51.1	01.7
17	44 42.3	35 00.4	46.8	164 02.6	42.9	344 24.1	01.1	351 53.4	01.7
18	59 44.8	50 01.7	N 8 47.8	179 03.7	S19 43.2	359 26.4	N20 01.1	6 55.8	N17 01.7
19	74 47.3	65 03.0	48.7	194 04.9	43.5	14 28.6	01.2	21 58.1	01.8
20	89 49.7	80 04.3	49.6	209 06.0	43.7	29 30.9	01.2	37 00.5	01.8
21	104 52.2	95 05.7 . .	50.6	224 07.1 . .	44.0	44 33.1 . .	01.3	52 02.8 . .	01.9
22	119 54.7	110 07.0	51.5	239 08.3	44.3	59 35.4	01.3	67 05.1	01.9
23	134 57.1	125 08.3	52.4	254 09.4	44.6	74 37.6	01.4	82 07.5	01.9
20 00	149 59.6	140 09.6	N 8 53.3	269 10.5	S19 44.8	89 39.9	N20 01.4	97 09.8	N17 02.0
01	165 02.1	155 11.0	54.3	284 11.7	45.1	104 42.1	01.5	112 12.2	02.0
02	180 04.5	170 12.3	55.2	299 12.8	45.4	119 44.4	01.5	127 14.5	02.1
03	195 07.0	185 13.6 . .	56.1	314 13.9 . .	45.6	134 46.6 . .	01.6	142 16.9 . .	02.1
04	210 09.4	200 15.0	57.0	329 15.1	45.9	149 48.9	01.6	157 19.2	02.1
05	225 11.9	215 16.3	58.0	344 16.2	46.2	164 51.1	01.7	172 21.6	02.2
06	240 14.4	230 17.6	N 8 58.9	359 17.3	S19 46.5	179 53.4	N20 01.7	187 23.9	N17 02.2
07	255 16.8	245 19.0	8 59.8	14 18.5	46.7	194 55.6	01.8	202 26.3	02.3
08	270 19.3	260 20.3	9 00.7	29 19.6	47.0	209 57.9	01.8	217 28.6	02.3
M 09	285 21.8	275 21.7 . .	01.6	44 20.7 . .	47.3	225 00.1 . .	01.9	232 31.0 . .	02.3
A 10	300 24.2	290 23.0	02.5	59 21.9	47.6	240 02.4	01.9	247 33.3	02.4
R 11	315 26.7	305 24.4	03.5	74 23.0	47.8	255 04.6	02.0	262 35.6	02.4
T 12	330 29.2	320 25.7	N 9 04.4	89 24.1	S19 48.1	270 06.9	N20 02.0	277 38.0	N17 02.5
E 13	345 31.6	335 27.1	05.3	104 25.3	48.4	285 09.1	02.1	292 40.3	02.5
S 14	0 34.1	350 28.4	06.2	119 26.4	48.6	300 11.3	02.1	307 42.7	02.5
15	15 36.6	5 29.8 . .	07.1	134 27.5 . .	48.9	315 13.6 . .	02.2	322 45.0 . .	02.6
16	30 39.0	20 31.2	08.0	149 28.7	49.2	330 15.8	02.2	337 47.4	02.6
17	45 41.5	35 32.5	08.9	164 29.8	49.5	345 18.1	02.3	352 49.7	02.7
18	60 43.9	50 33.9	N 9 09.8	179 30.9	S19 49.7	0 20.3	N20 02.3	7 52.0	N17 02.7
19	75 46.4	65 35.3	10.8	194 32.1	50.0	15 22.6	02.4	22 54.4	02.7
20	90 48.9	80 36.7	11.7	209 33.2	50.3	30 24.8	02.4	37 56.7	02.8
21	105 51.3	95 38.0 . .	12.6	224 34.3 . .	50.5	45 27.1 . .	02.5	52 59.1 . .	02.8
22	120 53.8	110 39.4	13.5	239 35.5	50.8	60 29.3	02.6	68 01.4	02.9
23	135 56.3	125 40.8	14.4	254 36.6	51.1	75 31.5	02.6	83 03.8	02.9
Pas. Mer.	h m 14 01.7	*v* 1.3	*d* 0.9	*v* 1.1	*d* 0.3	*v* 2.3	*d* 0.0	*v* 2.3	*d* 0.0

ESTRELLAS		
Nombre	A.H.S	Dec.
	° ′	° ′
Acamar	315 25.7	S40 18.4
Achernar	335 34.2	S57 14.3
Acrux	173 19.7	S63 06.1
Adhara	255 19.9	S28 58.6
Aldebaran	291 00.4	N16 30.6
Alioth	166 28.7	N55 57.1
Alkaid	153 06.2	N49 18.3
Al Na'ir	27 56.2	S46 57.5
Alnilam	275 56.0	S 1 12.2
Alphard	218 05.2	S 8 39.9
Alphecca	126 19.1	N26 42.5
Alpheratz	357 53.8	N29 05.7
Altair	62 17.9	N 8 52.1
Ankaa	353 25.5	S42 18.3
Antares	112 38.2	S26 26.0
Arcturus	146 04.4	N19 10.5
Atria	107 48.9	S69 01.5
Avior	234 21.4	S59 30.9
Bellatrix	278 42.2	N 6 20.9
Betelgeuse	271 11.6	N 7 24.3
Canopus	264 00.1	S52 42.1
Capella	280 48.6	N46 00.0
Deneb	49 38.5	N45 16.9
Denebola	182 43.2	N14 33.9
Diphda	349 05.8	S17 59.1
Dubhe	194 02.7	N61 44.6
Elnath	278 24.7	N28 36.5
Eltanin	90 50.9	N51 29.1
Enif	33 56.9	N 9 52.6
Fomalhaut	15 34.9	S29 37.2
Gacrux	172 11.3	S57 07.0
Gienah	176 02.0	S17 32.8
Hadar	149 01.4	S60 22.4
Hamal	328 11.8	N23 28.0
Kaus Aust.	83 56.8	S34 23.0
Kochab	137 19.2	N74 08.8
Markab	13 48.3	N15 12.5
Menkar	314 25.2	N 4 05.5
Menkent	148 18.8	S36 22.4
Miaplacidus	221 40.9	S69 43.4
Mirfak	308 54.3	N49 52.0
Nunki	76 10.5	S26 17.7
Peacock	53 34.9	S56 43.9
Pollux	243 39.2	N28 01.4
Procyon	245 09.6	N 5 13.2
Rasalhague	96 15.5	N12 33.4
Regulus	207 53.4	N11 57.7
Rigel	281 21.2	S 8 12.2
Rigil Kent.	140 04.9	S60 50.1
Sabik	102 23.7	S15 43.6
Schedar	349 52.1	N56 32.6
Shaula	96 35.2	S37 06.2
Sirius	258 42.0	S16 43.2
Spica	158 41.2	S11 10.0
Suhail	222 59.1	S43 26.3
Vega	80 45.8	N38 46.9
Zuben'ubi	137 16.0	S16 02.7

	A.H.S.	Pas. Mer.
	° ′	h m
Venus	350 38.0	14 40
Marte	119 42.9	6 05
Júpiter	299 45.4	18 02
Saturno	307 13.0	17 32

T.U.	SOL				LUNA					
	A.H.G.		Dec.		A.H.G.	v	Dec.	d	P.H.	
d h	° ′		° ′		° ′	′	° ′	′	′	
18 00	176 30.8		S11 41.1		236 23.9	11.3	S22 14.4	2.2	54.5	
01	191 30.9		40.2		250 54.2	11.2	22 16.6	2.1	54.5	
02	206 30.9		39.3		265 24.4	11.2	22 18.7	2.1	54.4	
03	221 31.0	. .	38.4		279 54.6	11.3	22 20.8	1.9	54.4	
04	236 31.0		37.5		294 24.9	11.2	22 22.7	1.8	54.4	
05	251 31.1		36.7		308 55.1	11.3	22 24.5	1.7	54.4	
06	266 31.1		S11 35.8		323 25.4	11.2	S22 26.2	1.6	54.4	
07	281 31.2		34.9		337 55.6	11.2	22 27.8	1.5	54.4	
08	296 31.2		34.0		352 25.8	11.3	22 29.3	1.4	54.4	
D 09	311 31.3	. .	33.1		6 56.1	11.2	22 30.7	1.2	54.3	
O 10	326 31.4		32.2		21 26.3	11.3	22 31.9	1.2	54.3	
M 11	341 31.4		31.4		35 56.6	11.2	22 33.1	1.0	54.3	
I 12	356 31.5		S11 30.5		50 26.8	11.3	S22 34.1	1.0	54.3	
N 13	11 31.5		29.6		64 57.1	11.2	22 35.1	0.8	54.3	
G 14	26 31.6		28.7		79 27.3	11.3	22 35.9	0.8	54.3	
O 15	41 31.6	. .	27.8		93 57.6	11.3	22 36.7	0.6	54.3	
16	56 31.7		26.9		108 27.9	11.2	22 37.3	0.5	54.3	
17	71 31.7		26.0		122 58.1	11.3	22 37.8	0.4	54.2	
18	86 31.8		S11 25.2		137 28.4	11.3	S22 38.2	0.3	54.2	
19	101 31.8		24.3		151 58.7	11.3	22 38.5	0.2	54.2	
20	116 31.9		23.4		166 29.0	11.3	22 38.7	0.1	54.2	
21	131 32.0	. .	22.5		180 59.3	11.3	22 38.8	0.0	54.2	
22	146 32.0		21.6		195 29.6	11.3	22 38.8	0.1	54.2	
23	161 32.1		20.7		209 59.9	11.4	22 38.7	0.3	54.2	
19 00	176 32.1		S11 19.8		224 30.3	11.3	S22 38.4	0.3	54.2	
01	191 32.2		18.9		239 00.6	11.4	22 38.1	0.4	54.2	
02	206 32.2		18.0		253 31.0	11.3	22 37.7	0.6	54.2	
03	221 32.3	. .	17.2		268 01.3	11.4	22 37.1	0.6	54.1	
04	236 32.4		16.3		282 31.7	11.4	22 36.5	0.8	54.1	
05	251 32.4		15.4		297 02.1	11.4	22 35.7	0.9	54.1	
06	266 32.5		S11 14.5		311 32.5	11.4	S22 34.8	1.0	54.1	
07	281 32.5		13.6		326 02.9	11.5	22 33.8	1.0	54.1	
L 08	296 32.6		12.7		340 33.4	11.4	22 32.8	1.2	54.1	
09	311 32.7	. .	11.8		355 03.8	11.5	22 31.6	1.3	54.1	
U 10	326 32.7		10.9		9 34.3	11.5	22 30.3	1.4	54.1	
11	341 32.8		10.0		24 04.8	11.5	22 28.9	1.5	54.1	
N 12	356 32.8		S11 09.1		38 35.3	11.5	S22 27.4	1.6	54.1	
E 13	11 32.9		08.2		53 05.8	11.5	22 25.8	1.7	54.1	
14	26 33.0		07.3		67 36.3	11.5	22 24.1	1.9	54.1	
S 15	41 33.0	. .	06.4		82 06.8	11.6	22 22.2	1.9	54.1	
16	56 33.1		05.6		96 37.4	11.6	22 20.3	2.0	54.0	
17	71 33.2		04.7		111 08.0	11.6	22 18.3	2.1	54.0	
18	86 33.2		S11 03.8		125 38.6	11.6	S22 16.2	2.3	54.0	
19	101 33.3		02.9		140 09.2	11.7	22 13.9	2.3	54.0	
20	116 33.3		02.0		154 39.9	11.6	22 11.6	2.5	54.0	
21	131 33.4	. .	01.1		169 10.5	11.7	22 09.1	2.5	54.0	
22	146 33.5		11 00.2		183 41.2	11.7	22 06.6	2.6	54.0	
23	161 33.5		10 59.3		198 11.9	11.8	22 04.0	2.8	54.0	
20 00	176 33.6		S10 58.4		212 42.7	11.7	S22 01.2	2.8	54.0	
01	191 33.7		57.5		227 13.4	11.8	21 58.4	3.0	54.0	
02	206 33.7		56.6		241 44.2	11.8	21 55.4	3.0	54.0	
03	221 33.8	. .	55.7		256 15.0	11.8	21 52.4	3.2	54.0	
04	236 33.9		54.8		270 45.8	11.9	21 49.2	3.2	54.0	
05	251 33.9		53.9		285 16.7	11.9	21 46.0	3.4	54.0	
06	266 34.0		S10 53.0		299 47.6	11.9	S21 42.6	3.4	54.0	
07	281 34.1		52.1		314 18.5	11.9	21 39.2	3.6	54.0	
M 08	296 34.1		51.2		328 49.4	12.0	21 35.6	3.6	54.0	
A 09	311 34.2	. .	50.3		343 20.4	12.0	21 32.0	3.8	54.0	
R 10	326 34.3		49.4		357 51.4	12.0	21 28.2	3.8	54.0	
11	341 34.3		48.5		12 22.4	12.0	21 24.4	4.0	54.0	
T 12	356 34.4		S10 47.6		26 53.4	12.1	S21 20.4	4.0	54.0	
13	11 34.5		46.7		41 24.5	12.1	21 16.4	4.2	54.0	
E 14	26 34.5		45.8		55 55.6	12.1	21 12.2	4.2	54.0	
S 15	41 34.6	. .	44.9		70 26.7	12.1	21 08.0	4.4	54.0	
16	56 34.7		44.0		84 57.8	12.2	21 03.6	4.4	54.0	
17	71 34.7		43.1		99 29.0	12.2	20 59.2	4.5	54.0	
18	86 34.8		S10 42.2		114 00.2	12.3	S20 54.7	4.6	54.0	
19	101 34.9		41.3		128 31.5	12.3	20 50.1	4.8	54.0	
20	116 34.9		40.4		143 02.8	12.3	20 45.3	4.8	54.0	
21	131 35.0	. .	39.5		157 34.1	12.3	20 40.5	4.9	54.0	
22	146 35.1		38.6		172 05.4	12.4	20 35.6	5.0	54.0	
23	161 35.2		37.7		186 36.8	12.4	S20 30.6	5.1	54.0	
	SD 16.2		d 0.9		SD	14.8	14.7		14.7	

Lat.	Crepúsculo Náutico	Crepúsculo Civil	Orto Sol	Orto Luna 18	Orto Luna 19	Orto Luna 20	Orto Luna 21
°	h m	h m	h m	h m	h m	h m	h m
N 72	05 57	07 15	08 31	▬	▬	▬	▬
N 70	05 57	07 08	08 14	▬	▬	▬	10 05
68	05 57	07 02	08 01	▬	▬	09 21	09 02
66	05 57	06 56	07 50	07 04	07 56	08 18	08 26
64	05 56	06 52	07 41	06 20	07 12	07 43	08 01
62	05 56	06 48	07 34	05 51	06 42	07 18	07 41
60	05 56	06 44	07 27	05 29	06 20	06 58	07 24
N 58	05 55	06 41	07 21	05 11	06 02	06 41	07 10
56	05 54	06 38	07 16	04 56	05 47	06 27	06 58
54	05 54	06 35	07 11	04 43	05 33	06 15	06 48
52	05 53	06 32	07 07	04 31	05 22	06 04	06 39
50	05 53	06 30	07 03	04 21	05 12	05 55	06 30
45	05 51	06 25	06 55	04 00	04 51	05 35	06 13
N 40	05 49	06 20	06 48	03 43	04 33	05 18	05 58
35	05 46	06 16	06 42	03 29	04 19	05 04	05 46
30	05 44	06 12	06 36	03 16	04 06	04 52	05 35
20	05 39	06 04	06 27	02 55	03 45	04 32	05 16
N 10	05 32	05 57	06 18	02 37	03 26	04 14	05 00
0	05 25	05 49	06 10	02 19	03 09	03 57	04 45
S 10	05 16	05 41	06 02	02 02	02 51	03 40	04 30
20	05 04	05 31	05 54	01 44	02 33	03 23	04 13
30	04 50	05 19	05 44	01 23	02 11	03 02	03 55
35	04 40	05 11	05 38	01 11	01 59	02 50	03 44
40	04 28	05 03	05 31	00 56	01 44	02 36	03 31
45	04 14	04 52	05 23	00 40	01 27	02 19	03 16
S 50	03 56	04 39	05 14	00 19	01 06	01 59	02 58
52	03 47	04 32	05 09	00 09	00 56	01 49	02 49
54	03 36	04 25	05 04	24 44	00 44	01 38	02 40
56	03 24	04 18	04 59	24 31	00 31	01 26	02 29
58	03 10	04 09	04 53	24 16	00 16	01 12	02 16
S 60	02 53	03 58	04 46	23 58	24 55	00 55	02 01

Lat.	Ocaso Sol	Crepúsculo Civil	Crepúsculo Náutico	Ocaso Luna 18	Ocaso Luna 19	Ocaso Luna 20	Ocaso Luna 21
°	h m	h m	h m	h m	h m	h m	h m
N 72	15 59	17 14	18 33	▬	▬	▬	▬
N 70	16 15	17 21	18 33	▬	▬	▬	11 58
68	16 28	17 28	18 33	▬	▬	11 02	13 00
66	16 39	17 33	18 33	09 57	10 47	12 05	13 35
64	16 47	17 37	18 33	10 40	11 31	12 40	14 00
62	16 55	17 41	18 33	11 10	12 00	13 05	14 20
60	17 02	17 45	18 33	11 32	12 23	13 25	14 35
N 58	17 07	17 48	18 34	11 50	12 41	13 41	14 49
56	17 13	17 51	18 34	12 05	12 56	13 55	15 00
54	17 17	17 54	18 35	12 18	13 09	14 07	15 11
52	17 21	17 56	18 35	12 30	13 20	14 17	15 20
50	17 25	17 58	18 36	12 40	13 30	14 27	15 28
45	17 34	18 03	18 38	13 01	13 51	14 46	15 45
N 40	17 40	18 08	18 40	13 19	14 08	15 02	15 58
35	17 46	18 12	18 42	13 33	14 23	15 15	16 10
30	17 52	18 16	18 44	13 46	14 35	15 27	16 20
20	18 01	18 23	18 49	14 07	14 57	15 47	16 38
N 10	18 09	18 31	18 55	14 26	15 15	16 04	16 53
0	18 17	18 38	19 03	14 43	15 32	16 20	17 07
S 10	18 25	18 47	19 12	15 01	15 49	16 36	17 22
20	18 34	18 56	19 23	15 19	16 08	16 54	17 37
30	18 44	19 08	19 38	15 41	16 29	17 13	17 54
35	18 49	19 16	19 47	15 53	16 41	17 25	18 04
40	18 56	19 24	19 58	16 08	16 55	17 38	18 15
45	19 04	19 35	20 12	16 25	17 12	17 53	18 28
S 50	19 13	19 48	20 30	16 46	17 33	18 12	18 45
52	19 17	19 54	20 39	16 56	17 43	18 21	18 52
54	19 22	20 01	20 50	17 08	17 54	18 31	19 00
56	19 27	20 08	21 01	17 21	18 06	18 42	19 10
58	19 33	20 17	21 15	17 36	18 21	18 55	19 21
S 60	19 40	20 27	21 32	17 54	18 38	19 10	19 33

Día	SOL E.T. (−) 00h	SOL E.T. (−) 12h	SOL Pas. Mer.	LUNA Pas. Mer. Sup.	LUNA Pas. Mer. Inf.	LUNA Edad	LUNA Fase
d	m s	m s	h m	h m	h m	d %	
18	13 57	13 54	12 14	08 31	20 56	25 20	
19	13 52	13 49	12 14	09 20	21 45	26 13	
20	13 46	13 43	12 14	10 09	22 33	27 7	

(MIE., JUE., VIE.) 21, 22, 23 FEBRERO DEL 2001

T.U.	ARIES	VENUS −4.6		MARTE +0.6		JUPITER −2.3		SATURNO +0.2	
d h	A.H.G.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.
	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
21 00	150 58.7	140 42.2	N 9 15.3	269 37.8	S19 51.3	90 33.8	N20 02.7	98 06.1	N17 02.9
01	166 01.2	155 43.6	16.2	284 38.9	51.6	105 36.0	02.7	113 08.4	03.0
02	181 03.7	170 44.9	17.1	299 40.0	51.9	120 38.3	02.8	128 10.8	03.0
03	196 06.1	185 46.3 . .	18.0	314 41.2 . .	52.1	135 40.5 . .	02.8	143 13.1 . .	03.1
04	211 08.6	200 47.7	18.9	329 42.3	52.4	150 42.7	02.9	158 15.5	03.1
05	226 11.0	215 49.1	19.8	344 43.4	52.7	165 45.0	02.9	173 17.8	03.1
06	241 13.5	230 50.5	N 9 20.7	359 44.6	S19 53.0	180 47.2	N20 03.0	188 20.2	N17 03.2
07	256 16.0	245 51.9	21.6	14 45.7	53.2	195 49.5	03.0	203 22.5	03.2
08	271 18.4	260 53.3	22.5	29 46.9	53.5	210 51.7	03.1	218 24.8	03.3
09	286 20.9	275 54.7 . .	23.4	44 48.0 . .	53.8	225 53.9 . .	03.1	233 27.2 . .	03.3
10	301 23.4	290 56.1	24.3	59 49.1	54.0	240 56.2	03.2	248 29.5	03.3
11	316 25.8	305 57.6	25.1	74 50.3	54.3	255 58.4	03.2	263 31.9	03.4
12	331 28.3	320 59.0	N 9 26.0	89 51.4	S19 54.6	271 00.7	N20 03.3	278 34.2	N17 03.4
13	346 30.8	336 00.4	26.9	104 52.6	54.8	286 02.9	03.3	293 36.5	03.5
14	1 33.2	351 01.8	27.8	119 53.7	55.1	301 05.1	03.4	308 38.9	03.5
15	16 35.7	6 03.2 . .	28.7	134 54.8 . .	55.4	316 07.4 . .	03.4	323 41.2 . .	03.5
16	31 38.2	21 04.6	29.6	149 56.0	55.6	331 09.6	03.5	338 43.6	03.6
17	46 40.6	36 06.1	30.5	164 57.1	55.9	346 11.8	03.5	353 45.9	03.6
18	61 43.1	51 07.5	N 9 31.4	179 58.3	S19 56.2	1 14.1	N20 03.6	8 48.2	N17 03.7
19	76 45.5	66 08.9	32.3	194 59.4	56.4	16 16.3	03.6	23 50.6	03.7
20	91 48.0	81 10.4	33.1	210 00.5	56.7	31 18.6	03.7	38 52.9	03.8
21	106 50.5	96 11.8 . .	34.0	225 01.7 . .	56.9	46 20.8 . .	03.7	53 55.2 . .	03.8
22	121 52.9	111 13.2	34.9	240 02.8	57.2	61 23.0	03.8	68 57.6	03.8
23	136 55.4	126 14.7	35.8	255 04.0	57.5	76 25.3	03.8	83 59.9	03.9
22 00	151 57.9	141 16.1	N 9 36.7	270 05.1	S19 57.7	91 27.5	N20 03.9	99 02.3	N17 03.9
01	167 00.3	156 17.6	37.5	285 06.2	58.0	106 29.7	04.0	114 04.6	04.0
02	182 02.8	171 19.0	38.4	300 07.4	58.3	121 32.0	04.0	129 06.9	04.0
03	197 05.3	186 20.5 . .	39.3	315 08.5 . .	58.5	136 34.2 . .	04.1	144 09.3 . .	04.0
04	212 07.7	201 21.9	40.2	330 09.7	58.8	151 36.4	04.1	159 11.6	04.1
05	227 10.2	216 23.4	41.0	345 10.8	59.1	166 38.7	04.2	174 13.9	04.1
06	242 12.7	231 24.8	N 9 41.9	0 12.0	S19 59.3	181 40.9	N20 04.2	189 16.3	N17 04.2
07	257 15.1	246 26.3	42.8	15 13.1	59.6	196 43.1	04.3	204 18.6	04.2
08	272 17.6	261 27.7	43.7	30 14.2	19 59.8	211 45.4	04.3	219 21.0	04.3
09	287 20.0	276 29.2 . .	44.5	45 15.4	20 00.1	226 47.6 . .	04.4	234 23.3 . .	04.3
10	302 22.5	291 30.7	45.4	60 16.5	00.4	241 49.8	04.4	249 25.6	04.3
11	317 25.0	306 32.1	46.3	75 17.7	00.6	256 52.0	04.5	264 28.0	04.4
12	332 27.4	321 33.6	N 9 47.1	90 18.8	S20 00.9	271 54.3	N20 04.5	279 30.3	N17 04.4
13	347 29.9	336 35.1	48.0	105 20.0	01.2	286 56.5	04.6	294 32.6	04.5
14	2 32.4	351 36.6	48.9	120 21.1	01.4	301 58.7	04.6	309 35.0	04.5
15	17 34.8	6 38.0 . .	49.7	135 22.2 . .	01.7	317 01.0 . .	04.7	324 37.3 . .	04.5
16	32 37.3	21 39.5	50.6	150 23.4	01.9	332 03.2	04.8	339 39.6	04.6
17	47 39.8	36 41.0	51.5	165 24.5	02.2	347 05.4	04.8	354 42.0	04.6
18	62 42.2	51 42.5	N 9 52.3	180 25.7	S20 02.5	2 07.7	N20 04.9	9 44.3	N17 04.7
19	77 44.7	66 44.0	53.2	195 26.8	02.7	17 09.9	04.9	24 46.6	04.7
20	92 47.1	81 45.5	54.0	210 28.0	03.0	32 12.1	05.0	39 49.0	04.8
21	107 49.6	96 47.0 . .	54.9	225 29.1 . .	03.2	47 14.3 . .	05.0	54 51.3 . .	04.8
22	122 52.1	111 48.5	55.8	240 30.3	03.5	62 16.6	05.1	69 53.6	04.8
23	137 54.5	126 50.0	56.6	255 31.4	03.8	77 18.8	05.1	84 56.0	04.9
23 00	152 57.0	141 51.5	N 9 57.5	270 32.6	S20 04.0	92 21.0	N20 05.2	99 58.3	N17 04.9
01	167 59.5	156 53.0	58.3	285 33.7	04.3	107 23.2	05.2	115 00.6	05.0
02	183 01.9	171 54.5	9 59.2	300 34.9	04.5	122 25.5	05.3	130 03.0	05.0
03	198 04.4	186 56.0	10 00.0	315 36.0 . .	04.8	137 27.7 . .	05.3	145 05.3 . .	05.1
04	213 06.9	201 57.5	00.9	330 37.1	05.1	152 29.9	05.4	160 07.6	05.1
05	228 09.3	216 59.0	01.7	345 38.3	05.3	167 32.1	05.5	175 10.0	05.1
06	243 11.8	232 00.6	N10 02.6	0 39.4	S20 05.6	182 34.4	N20 05.5	190 12.3	N17 05.2
07	258 14.3	247 02.1	03.4	15 40.6	05.8	197 36.6	05.6	205 14.6	05.2
08	273 16.7	262 03.6	04.3	30 41.7	06.1	212 38.8	05.6	220 17.0	05.3
09	288 19.2	277 05.1 . .	05.1	45 42.9 . .	06.4	227 41.0 . .	05.7	235 19.3 . .	05.3
10	303 21.6	292 06.7	06.0	60 44.0	06.6	242 43.3	05.7	250 21.6	05.4
11	318 24.1	307 08.2	06.8	75 45.2	06.9	257 45.5	05.8	265 24.0	05.4
12	333 26.6	322 09.7	N10 07.6	90 46.3	S20 07.1	272 47.7	N20 05.8	280 26.3	N17 05.4
13	348 29.0	337 11.3	08.5	105 47.5	07.4	287 49.9	05.9	295 28.6	05.5
14	3 31.5	352 12.8	09.3	120 48.6	07.6	302 52.2	05.9	310 31.0	05.5
15	18 34.0	7 14.3 . .	10.2	135 49.8 . .	07.9	317 54.4 . .	06.0	325 33.3 . .	05.6
16	33 36.4	22 15.9	11.0	150 50.9	08.2	332 56.6	06.0	340 35.6	05.6
17	48 38.9	37 17.4	11.8	165 52.1	08.4	347 58.8	06.1	355 38.0	05.7
18	63 41.4	52 19.0	N10 12.7	180 53.2	S20 08.7	3 01.0	N20 06.2	10 40.3	N17 05.7
19	78 43.8	67 20.5	13.5	195 54.4	08.9	18 03.3	06.2	25 42.6	05.7
20	93 46.3	82 22.1	14.3	210 55.5	09.2	33 05.5	06.3	40 44.9	05.8
21	108 48.8	97 23.7 . .	15.2	225 56.7 . .	09.4	48 07.7 . .	06.3	55 47.3 . .	05.8
22	123 51.2	112 25.2	16.0	240 57.8	09.7	63 09.9	06.4	70 49.6	05.9
23	138 53.7	127 26.8	16.8	255 59.0	09.9	78 12.1	06.4	85 51.9	05.9
Pas. Mer.	h m 13 49.9	*v* 1.5	*d* 0.9	*v* 1.1	*d* 0.3	*v* 2.2	*d* 0.1	*v* 2.3	*d* 0.0

ESTRELLAS

Nombre	A.H.S.	Dec.
	° ′	° ′
Acamar	315 25.7	S40 18.4
Achernar	335 34.2	S57 14.2
Acrux	173 19.6	S63 06.1
Adhara	255 19.9	S28 58.6
Aldebaran	291 00.4	N16 30.6
Alioth	166 28.6	N55 57.1
Alkaid	153 06.1	N49 18.3
Al Na'ir	27 56.2	S46 57.5
Alnilam	275 56.0	S 1 12.2
Alphard	218 05.2	S 8 39.9
Alphecca	126 19.1	N26 42.5
Alpheratz	357 53.8	N29 05.7
Altair	62 17.9	N 8 52.1
Ankaa	353 25.5	S42 18.3
Antares	112 38.2	S26 26.0
Arcturus	146 04.4	N19 10.5
Atria	107 48.8	S69 01.5
Avior	234 21.4	S59 30.9
Bellatrix	278 42.3	N 6 20.9
Betelgeuse	271 11.6	N 7 24.3
Canopus	264 00.1	S52 42.1
Capella	280 48.6	N46 00.0
Deneb	49 38.5	N45 16.9
Denebola	182 43.2	N14 33.9
Diphda	349 05.8	S17 59.1
Dubhe	194 02.7	N61 44.6
Elnath	278 24.7	N28 36.5
Eltanin	90 50.9	N51 29.1
Enif	33 56.9	N 9 52.6
Fomalhaut	15 34.9	S29 37.2
Gacrux	172 11.3	S57 07.0
Gienah	176 02.0	S17 32.9
Hadar	149 01.4	S60 22.4
Hamal	328 11.9	N23 28.0
Kaus Aust.	83 56.8	S34 23.0
Kochab	137 19.1	N74 08.8
Markab	13 48.3	N15 12.5
Menkar	314 25.2	N 4 05.5
Menkent	148 18.8	S36 22.4
Miaplacidus	221 40.9	S69 43.4
Mirfak	308 54.3	N49 52.0
Nunki	76 10.5	S26 17.7
Peacock	53 34.9	S56 43.9
Pollux	243 39.2	N28 01.4
Procyon	245 09.6	N 5 13.2
Rasalhague	96 15.5	N12 33.4
Regulus	207 53.4	N11 57.7
Rigel	281 21.2	S 8 12.2
Rigil Kent.	140 04.8	S60 50.1
Sabik	102 23.7	S15 43.6
Schedar	349 52.1	N56 32.6
Shaula	96 35.2	S37 06.2
Sirius	258 42.0	S16 43.2
Spica	158 41.2	S11 10.0
Suhail	222 59.1	S43 26.3
Vega	80 45.7	N38 46.8
Zuben'ubi	137 16.0	S16 02.7

	A.H.S.	Pas. Mer.
	° ′	h m
Venus	349 18.2	14 34
Marte	118 07.2	5 59
Júpiter	299 29.6	17 52
Saturno	307 04.4	17 21

T.U.	SOL				LUNA					
	A.H.G.		Dec.		A.H.G.	v	Dec.	d	P.H.	
d h	° ′		° ′		° ′	′	° ′	′	′	
21 00	176 35.2		S10 36.8		201 08.2	12.4	S20 25.5	5.1	54.0	
01	191 35.3		35.9		215 39.6	12.5	20 20.4	5.3	54.0	
02	206 35.4		35.0		230 11.1	12.5	20 15.1	5.4	54.0	
03	221 35.4	. .	34.1		244 42.6	12.5	20 09.7	5.4	54.0	
04	236 35.5		33.2		259 14.1	12.5	20 04.3	5.6	54.0	
05	251 35.6		32.3		273 45.6	12.6	19 58.7	5.6	54.0	
06	266 35.7		S10 31.4		288 17.2	12.7	S19 53.1	5.8	54.0	
07	281 35.7		30.5		302 48.9	12.6	19 47.3	5.8	54.0	
M 08	296 35.8		29.5		317 20.5	12.7	19 41.5	5.9	54.0	
I 09	311 35.9	. .	28.6		331 52.2	12.7	19 35.6	6.0	54.0	
E 10	326 36.0		27.7		346 23.9	12.8	19 29.6	6.1	54.0	
R 11	341 36.0		26.8		0 55.7	12.8	19 23.5	6.1	54.0	
C 12	356 36.1		S10 25.9		15 27.5	12.8	S19 17.4	6.3	54.0	
O 13	11 36.2		25.0		29 59.3	12.9	19 11.1	6.3	54.0	
L 14	26 36.3		24.1		44 31.2	12.9	19 04.8	6.4	54.0	
E 15	41 36.3	. .	23.2		59 03.1	12.9	18 58.4	6.6	54.0	
S 16	56 36.4		22.3		73 35.0	13.0	18 51.8	6.6	54.0	
17	71 36.5		21.4		88 07.0	13.0	18 45.2	6.6	54.0	
18	86 36.6		S10 20.5		102 39.0	13.0	S18 38.6	6.8	54.0	
19	101 36.6		19.6		117 11.0	13.1	18 31.8	6.8	54.0	
20	116 36.7		18.7		131 43.1	13.1	18 25.0	7.0	54.0	
21	131 36.8	. .	17.7		146 15.2	13.2	18 18.0	7.0	54.0	
22	146 36.9		16.8		160 47.4	13.1	18 11.0	7.1	54.0	
23	161 36.9		15.9		175 19.5	13.2	18 03.9	7.1	54.0	
22 00	176 37.0		S10 15.0		189 51.7	13.3	S17 56.8	7.3	54.0	
01	191 37.1		14.1		204 24.0	13.3	17 49.5	7.3	54.0	
02	206 37.2		13.2		218 56.3	13.3	17 42.2	7.4	54.0	
03	221 37.3	. .	12.3		233 28.6	13.3	17 34.8	7.5	54.0	
04	236 37.3		11.4		248 00.9	13.4	17 27.3	7.6	54.0	
05	251 37.4		10.5		262 33.3	13.4	17 19.7	7.6	54.0	
06	266 37.5		S10 09.5		277 05.7	13.5	S17 12.1	7.7	54.1	
07	281 37.6		08.6		291 38.2	13.5	17 04.4	7.8	54.1	
J 08	296 37.7		07.7		306 10.7	13.5	16 56.6	7.9	54.1	
U 09	311 37.7	. .	06.8		320 43.2	13.6	16 48.7	7.9	54.1	
E 10	326 37.8		05.9		335 15.8	13.6	16 40.8	8.1	54.1	
V 11	341 37.9		05.0		349 48.4	13.6	16 32.7	8.0	54.1	
E 12	356 38.0		S10 04.1		4 21.0	13.6	S16 24.7	8.2	54.1	
S 13	11 38.1		03.2		18 53.6	13.7	16 16.5	8.2	54.1	
14	26 38.1		02.2		33 26.3	13.8	16 08.3	8.3	54.1	
15	41 38.2	. .	01.3		47 59.1	13.7	16 00.0	8.4	54.1	
16	56 38.3		10 00.4		62 31.8	13.8	15 51.6	8.5	54.1	
17	71 38.4		9 59.5		77 04.6	13.9	15 43.1	8.5	54.1	
18	86 38.5		S 9 58.6		91 37.5	13.8	S15 34.6	8.6	54.1	
19	101 38.6		57.7		106 10.3	13.9	15 26.0	8.6	54.1	
20	116 38.6		56.8		120 43.2	13.9	15 17.4	8.7	54.1	
21	131 38.7	. .	55.8		135 16.1	14.0	15 08.7	8.8	54.1	
22	146 38.8		54.9		149 49.1	14.0	14 59.9	8.9	54.2	
23	161 38.9		54.0		164 22.1	14.0	14 51.0	8.9	54.2	
23 00	176 39.0		S 9 53.1		178 55.1	14.1	S14 42.1	9.0	54.2	
01	191 39.1		52.2		193 28.2	14.0	14 33.1	9.0	54.2	
02	206 39.1		51.3		208 01.2	14.2	14 24.1	9.1	54.2	
03	221 39.2	. .	50.3		222 34.4	14.1	14 15.0	9.2	54.2	
04	236 39.3		49.4		237 07.5	14.2	14 05.8	9.2	54.2	
05	251 39.4		48.5		251 40.7	14.2	13 56.6	9.3	54.2	
06	266 39.5		S 9 47.6		266 13.9	14.2	S13 47.3	9.4	54.2	
07	281 39.6		46.7		280 47.1	14.3	13 37.9	9.4	54.2	
V 08	296 39.7		45.7		295 20.4	14.3	13 28.5	9.5	54.2	
I 09	311 39.7	. .	44.8		309 53.7	14.3	13 19.0	9.5	54.2	
E 10	326 39.8		43.9		324 27.0	14.3	13 09.5	9.6	54.3	
R 11	341 39.9		43.0		339 00.3	14.4	12 59.9	9.7	54.3	
N 12	356 40.0		S 9 42.1		353 33.7	14.4	S12 50.2	9.7	54.3	
E 13	11 40.1		41.1		8 07.1	14.5	12 40.5	9.7	54.3	
S 14	26 40.2		40.2		22 40.6	14.4	12 30.8	9.9	54.3	
15	41 40.3	. .	39.3		37 14.0	14.5	12 20.9	9.8	54.3	
16	56 40.4		38.4		51 47.5	14.5	12 11.1	10.0	54.3	
17	71 40.4		37.5		66 21.0	14.6	12 01.1	10.0	54.3	
18	86 40.5		S 9 36.5		80 54.6	14.5	S11 51.1	10.0	54.3	
19	101 40.6		35.6		95 28.1	14.6	11 41.1	10.1	54.3	
20	116 40.7		34.7		110 01.7	14.6	11 31.0	10.1	54.4	
21	131 40.8	. .	33.8		124 35.3	14.6	11 20.9	10.2	54.4	
22	146 40.9		32.9		139 08.9	14.7	11 10.7	10.3	54.4	
23	161 41.0		31.9		153 42.6	14.7	S11 00.4	10.2	54.4	
	SD 16.2		d 0.9		SD	14.7	14.7		14.8	

Lat.	Crepúsculo Náutico	Crepúsculo Civil	Orto Sol	Orto Luna 21	Orto Luna 22	Orto Luna 23	Orto Luna 24
°	h m	h m	h m	h m	h m	h m	h m
N 72	05 43	07 01	08 14	▬	10 11	09 29	09 04
N 70	05 45	06 55	08 00	10 05	09 23	09 04	08 50
68	05 46	06 50	07 49	09 02	08 52	08 45	08 39
66	05 47	06 46	07 39	08 26	08 29	08 30	08 30
64	05 47	06 42	07 31	08 01	08 11	08 17	08 22
62	05 48	06 39	07 24	07 41	07 56	08 07	08 15
60	05 48	06 36	07 19	07 24	07 43	07 58	08 09
N 58	05 48	06 33	07 13	07 10	07 32	07 49	08 03
56	05 48	06 31	07 09	06 58	07 23	07 42	07 59
54	05 48	06 29	07 05	06 48	07 14	07 36	07 54
52	05 47	06 27	07 01	06 39	07 07	07 30	07 51
50	05 47	06 25	06 57	06 30	07 00	07 25	07 47
45	05 46	06 20	06 50	06 13	06 45	07 14	07 39
N 40	05 45	06 16	06 44	05 58	06 33	07 04	07 33
35	05 43	06 13	06 38	05 46	06 23	06 56	07 27
30	05 41	06 09	06 33	05 35	06 14	06 49	07 23
20	05 37	06 03	06 25	05 16	05 58	06 37	07 14
N 10	05 31	05 56	06 17	05 00	05 44	06 26	07 07
0	05 25	05 49	06 10	04 45	05 31	06 16	07 00
S 10	05 17	05 41	06 03	04 30	05 18	06 06	06 52
20	05 06	05 32	05 55	04 13	05 04	05 55	06 45
30	04 52	05 21	05 46	03 55	04 48	05 42	06 36
35	04 43	05 14	05 40	03 44	04 39	05 35	06 31
40	04 33	05 06	05 34	03 31	04 28	05 27	06 26
45	04 19	04 57	05 27	03 16	04 16	05 17	06 19
S 50	04 02	04 44	05 19	02 58	04 01	05 05	06 11
52	03 54	04 39	05 15	02 49	03 53	05 00	06 07
54	03 44	04 32	05 10	02 40	03 45	04 54	06 03
56	03 33	04 25	05 05	02 29	03 36	04 47	05 59
58	03 20	04 17	05 00	02 16	03 26	04 39	05 54
S 60	03 05	04 07	04 54	02 01	03 15	04 31	05 48

Lat.	Ocaso Sol	Crepúsculo Civil	Crepúsculo Náutico	Ocaso Luna 21	Ocaso Luna 22	Ocaso Luna 23	Ocaso Luna 24
°	h m	h m	h m	h m	h m	h m	h m
N 72	16 15	17 28	18 46	▬	13 29	15 43	17 38
N 70	16 29	17 34	18 44	11 58	14 15	16 06	17 50
68	16 40	17 38	18 43	13 00	14 45	16 24	18 00
66	16 49	17 43	18 42	13 35	15 07	16 38	18 08
64	16 57	17 46	18 41	14 00	15 24	16 50	18 14
62	17 04	17 49	18 41	14 20	15 39	16 59	18 20
60	17 09	17 52	18 41	14 35	15 51	17 08	18 25
N 58	17 15	17 55	18 40	14 49	16 01	17 15	18 30
56	17 19	17 57	18 40	15 00	16 10	17 21	18 33
54	17 23	17 59	18 40	15 11	16 18	17 27	18 37
52	17 27	18 01	18 41	15 20	16 25	17 32	18 40
50	17 30	18 03	18 41	15 28	16 31	17 37	18 43
45	17 38	18 08	18 42	15 45	16 45	17 47	18 49
N 40	17 44	18 11	18 43	15 58	16 56	17 55	18 54
35	17 49	18 15	18 44	16 10	17 06	18 02	18 59
30	17 54	18 18	18 46	16 20	17 14	18 08	19 02
20	18 02	18 25	18 50	16 38	17 29	18 19	19 09
N 10	18 10	18 31	18 56	16 53	17 41	18 28	19 15
0	18 17	18 38	19 02	17 07	17 53	18 37	19 20
S 10	18 24	18 45	19 10	17 22	18 05	18 46	19 26
20	18 32	18 54	19 21	17 37	18 17	18 55	19 31
30	18 41	19 05	19 34	17 54	18 31	19 05	19 38
35	18 46	19 12	19 43	18 04	18 39	19 11	19 41
40	18 52	19 20	19 53	18 15	18 48	19 18	19 45
45	18 59	19 29	20 07	18 28	18 59	19 26	19 50
S 50	19 07	19 41	20 23	18 45	19 12	19 35	19 56
52	19 11	19 47	20 32	18 52	19 18	19 39	19 59
54	19 15	19 53	20 41	19 00	19 24	19 44	20 01
56	19 20	20 00	20 52	19 10	19 32	19 49	20 05
58	19 25	20 08	21 04	19 21	19 40	19 55	20 08
S 60	19 31	20 18	21 19	19 33	19 49	20 02	20 12

Día	SOL E.T. (−) 00h	SOL E.T. (−) 12h	Pas. Mer.	LUNA Pas. Mer. Sup.	LUNA Pas. Mer. Inf.	LUNA Edad	LUNA Fase
d	m s	m s	h m	h m	h m	d	%
21	13 39	13 36	12 14	10 56	23 19	28	3
22	13 32	13 28	12 13	11 42	24 04	29	1
23	13 24	13 20	12 13	12 27	00 04	00	0

T.U.	ARIES	VENUS −4.6		MARTE +0.6		JUPITER −2.3		SATURNO +0.2	
d h	A.H.G.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.
	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
24 00	153 56.1	142 28.4	N10 17.7	271 00.1	S20 10.2	93 14.4	N20 06.5	100 54.3	N17 06.0
01	168 58.6	157 29.9	18.5	286 01.3	10.5	108 16.6	06.5	115 56.6	06.0
02	184 01.1	172 31.5	19.3	301 02.4	10.7	123 18.8	06.6	130 58.9	06.0
03	199 03.5	187 33.1 . .	20.1	316 03.6 . .	11.0	138 21.0 . .	06.7	146 01.3 . .	06.1
04	214 06.0	202 34.6	21.0	331 04.7	11.2	153 23.2	06.7	161 03.6	06.1
05	229 08.5	217 36.2	21.8	346 05.9	11.5	168 25.5	06.8	176 05.9	06.2
06	244 10.9	232 37.8	N10 22.6	1 07.0	S20 11.7	183 27.7	N20 06.8	191 08.2	N17 06.2
07	259 13.4	247 39.4	23.4	16 08.2	12.0	198 29.9	06.9	206 10.6	06.3
S 08	274 15.9	262 41.0	24.2	31 09.4	12.2	213 32.1	06.9	221 12.9	06.3
09	289 18.3	277 42.6 . .	25.1	46 10.5 . .	12.5	228 34.3 . .	07.0	236 15.2 . .	06.3
A 10	304 20.8	292 44.2	25.9	61 11.7	12.7	243 36.5	07.0	251 17.5	06.4
B 11	319 23.2	307 45.8	26.7	76 12.8	13.0	258 38.8	07.1	266 19.9	06.4
12	334 25.7	322 47.4	N10 27.5	91 14.0	S20 13.2	273 41.0	N20 07.2	281 22.2	N17 06.5
A 13	349 28.2	337 49.0	28.3	106 15.1	13.5	288 43.2	07.2	296 24.5	06.5
D 14	4 30.6	352 50.6	29.1	121 16.3	13.8	303 45.4	07.3	311 26.9	06.6
15	19 33.1	7 52.2 . .	29.9	136 17.4 . .	14.0	318 47.6 . .	07.3	326 29.2 . .	06.6
O 16	34 35.6	22 53.8	30.8	151 18.6	14.3	333 49.8	07.4	341 31.5	06.6
17	49 38.0	37 55.4	31.6	166 19.7	14.5	348 52.0	07.4	356 33.8	06.7
18	64 40.5	52 57.0	N10 32.4	181 20.9	S20 14.8	3 54.3	N20 07.5	11 36.2	N17 06.7
19	79 43.0	67 58.6	33.2	196 22.1	15.0	18 56.5	07.5	26 38.5	06.8
20	94 45.4	83 00.3	34.0	211 23.2	15.3	33 58.7	07.6	41 40.8	06.8
21	109 47.9	98 01.9 . .	34.8	226 24.4 . .	15.5	49 00.9 . .	07.7	56 43.1 . .	06.9
22	124 50.4	113 03.5	35.6	241 25.5	15.8	64 03.1	07.7	71 45.5	06.9
23	139 52.8	128 05.1	36.4	256 26.7	16.0	79 05.3	07.8	86 47.8	07.0
25 00	154 55.3	143 06.8	N10 37.2	271 27.8	S20 16.3	94 07.5	N20 07.8	101 50.1	N17 07.0
01	169 57.7	158 08.4	38.0	286 29.0	16.5	109 09.7	07.9	116 52.4	07.0
02	185 00.2	173 10.0	38.8	301 30.1	16.8	124 12.0	07.9	131 54.8	07.1
03	200 02.7	188 11.7 . .	39.6	316 31.3 . .	17.0	139 14.2 . .	08.0	146 57.1 . .	07.1
04	215 05.1	203 13.3	40.4	331 32.5	17.3	154 16.4	08.0	161 59.4	07.2
05	230 07.6	218 15.0	41.2	346 33.6	17.5	169 18.6	08.1	177 01.7	07.2
06	245 10.1	233 16.6	N10 42.0	1 34.8	S20 17.8	184 20.8	N20 08.2	192 04.1	N17 07.3
07	260 12.5	248 18.3	42.8	16 35.9	18.0	199 23.0	08.2	207 06.4	07.3
08	275 15.0	263 19.9	43.6	31 37.1	18.3	214 25.2	08.3	222 08.7	07.4
D 09	290 17.5	278 21.6 . .	44.4	46 38.2 . .	18.5	229 27.4 . .	08.3	237 11.0 . .	07.4
O 10	305 19.9	293 23.3	45.1	61 39.4	18.8	244 29.6	08.4	252 13.4	07.4
M 11	320 22.4	308 24.9	45.9	76 40.6	19.0	259 31.8	08.4	267 15.7	07.5
I 12	335 24.8	323 26.6	N10 46.7	91 41.7	S20 19.3	274 34.1	N20 08.5	282 18.0	N17 07.5
N 13	350 27.3	338 28.3	47.5	106 42.9	19.5	289 36.3	08.6	297 20.3	07.6
G 14	5 29.8	353 29.9	48.3	121 44.0	19.8	304 38.5	08.6	312 22.6	07.6
O 15	20 32.2	8 31.6 . .	49.1	136 45.2 . .	20.0	319 40.7 . .	08.7	327 25.0 . .	07.7
16	35 34.7	23 33.3	49.9	151 46.4	20.2	334 42.9	08.7	342 27.3	07.7
17	50 37.2	38 35.0	50.6	166 47.5	20.5	349 45.1	08.8	357 29.6	07.8
18	65 39.6	53 36.6	N10 51.4	181 48.7	S20 20.7	4 47.3	N20 08.8	12 31.9	N17 07.8
19	80 42.1	68 38.3	52.2	196 49.8	21.0	19 49.5	08.9	27 34.3	07.8
20	95 44.6	83 40.0	53.0	211 51.0	21.2	34 51.7	09.0	42 36.6	07.9
21	110 47.0	98 41.7 . .	53.7	226 52.2 . .	21.5	49 53.9 . .	09.0	57 38.9 . .	07.9
22	125 49.5	113 43.4	54.5	241 53.3	21.7	64 56.1	09.1	72 41.2	08.0
23	140 52.0	128 45.1	55.3	256 54.5	22.0	79 58.3	09.1	87 43.5	08.0
26 00	155 54.4	143 46.8	N10 56.1	271 55.7	S20 22.2	95 00.5	N20 09.2	102 45.9	N17 08.1
01	170 56.9	158 48.5	56.8	286 56.8	22.5	110 02.7	09.2	117 48.2	08.1
02	185 59.3	173 50.2	57.6	301 58.0	22.7	125 04.9	09.3	132 50.5	08.2
03	201 01.8	188 51.9 . .	58.4	316 59.1 . .	23.0	140 07.1 . .	09.4	147 52.8 . .	08.2
04	216 04.3	203 53.6	59.1	332 00.3	23.2	155 09.3	09.4	162 55.1	08.2
05	231 06.7	218 55.4	10 59.9	347 01.5	23.4	170 11.5	09.5	177 57.5	08.3
06	246 09.2	233 57.1	N11 00.7	2 02.6	S20 23.7	185 13.7	N20 09.5	192 59.8	N17 08.3
07	261 11.7	248 58.8	01.4	17 03.8	23.9	200 15.9	09.6	208 02.1	08.4
08	276 14.1	264 00.5	02.2	32 05.0	24.2	215 18.1	09.6	223 04.4	08.4
L 09	291 16.6	279 02.2 . .	03.0	47 06.1 . .	24.4	230 20.4 . .	09.7	238 06.7 . .	08.5
U 10	306 19.1	294 04.0	03.7	62 07.3	24.7	245 22.6	09.8	253 09.1	08.5
11	321 21.5	309 05.7	04.5	77 08.4	24.9	260 24.8	09.8	268 11.4	08.6
N 12	336 24.0	324 07.4	N11 05.2	92 09.6	S20 25.2	275 27.0	N20 09.9	283 13.7	N17 08.6
E 13	351 26.4	339 09.2	06.0	107 10.8	25.4	290 29.2	09.9	298 16.0	08.7
S 14	6 28.9	354 10.9	06.7	122 11.9	25.6	305 31.4	10.0	313 18.3	08.7
15	21 31.4	9 12.7 . .	07.5	137 13.1 . .	25.9	320 33.6 . .	10.0	328 20.7 . .	08.7
16	36 33.8	24 14.4	08.3	152 14.3	26.1	335 35.8	10.1	343 23.0	08.8
17	51 36.3	39 16.2	09.0	167 15.4	26.4	350 38.0	10.2	358 25.3	08.8
18	66 38.8	54 17.9	N11 09.8	182 16.6	S20 26.6	5 40.2	N20 10.2	13 27.6	N17 08.9
19	81 41.2	69 19.7	10.5	197 17.8	26.9	20 42.4	10.3	28 29.9	08.9
20	96 43.7	84 21.4	11.3	212 18.9	27.1	35 44.5	10.3	43 32.2	09.0
21	111 46.2	99 23.2 . .	12.0	227 20.1 . .	27.3	50 46.7 . .	10.4	58 34.6 . .	09.0
22	126 48.6	114 25.0	12.7	242 21.3	27.6	65 48.9	10.5	73 36.9	09.1
23	141 51.1	129 26.7	13.5	257 22.4	27.8	80 51.1	10.5	88 39.2	09.1
	h m								
Pas. Mer.	13 38.1	*v* 1.7	*d* 0.8	*v* 1.2	*d* 0.2	*v* 2.2	*d* 0.1	*v* 2.3	*d* 0.0

ESTRELLAS		
Nombre	A.H.S.	Dec.
	° ′	° ′
Acamar	315 25.8	S40 18.4
Achernar	335 34.2	S57 14.2
Acrux	173 19.6	S63 06.1
Adhara	255 19.9	S28 58.6
Aldebaran	291 00.4	N16 30.6
Alioth	166 28.6	N55 57.1
Alkaid	153 06.1	N49 18.3
Al Na'ir	27 56.2	S46 57.5
Alnilam	275 56.1	S 1 12.2
Alphard	218 05.3	S 8 39.9
Alphecca	126 19.1	N26 42.5
Alpheratz	357 53.8	N29 05.7
Altair	62 17.9	N 8 52.1
Ankaa	353 25.5	S42 18.3
Antares	112 38.1	S26 26.0
Arcturus	146 04.3	N19 10.5
Atria	107 48.8	S69 01.5
Avior	234 21.5	S59 31.0
Bellatrix	278 42.3	N 6 20.9
Betelgeuse	271 11.6	N 7 24.3
Canopus	264 00.2	S52 42.1
Capella	280 48.6	N46 00.0
Deneb	49 38.5	N45 16.8
Denebola	182 43.2	N14 33.9
Diphda	349 05.8	S17 59.1
Dubhe	194 02.7	N61 44.7
Elnath	278 24.7	N28 36.5
Eltanin	90 50.8	N51 29.0
Enif	33 56.9	N 9 52.6
Fomalhaut	15 34.9	S29 37.2
Gacrux	172 11.3	S57 07.0
Gienah	176 02.0	S17 32.9
Hadar	149 01.4	S60 22.4
Hamal	328 11.9	N23 28.0
Kaus Aust.	83 56.8	S34 23.0
Kochab	137 19.1	N74 08.8
Markab	13 48.3	N15 12.5
Menkar	314 25.3	N 4 05.5
Menkent	148 18.8	S36 22.4
Miaplacidus	221 40.9	S69 43.4
Mirfak	308 54.4	N49 52.0
Nunki	76 10.5	S26 17.7
Peacock	53 34.8	S56 43.9
Pollux	243 39.2	N28 01.4
Procyon	245 09.6	N 5 13.2
Rasalhague	96 15.5	N12 33.4
Regulus	207 53.4	N11 57.7
Rigel	281 21.2	S 8 12.2
Rigil Kent.	140 04.8	S60 50.1
Sabik	102 23.7	S15 43.6
Schedar	349 52.1	N56 32.6
Shaula	96 35.1	S37 06.2
Sirius	258 42.1	S16 43.2
Spica	158 41.2	S11 10.0
Suhail	222 59.2	S43 26.3
Vega	80 45.7	N38 46.8
Zuben'ubi	137 16.0	S16 02.7

	A.H.S.	Pas. Mer.
	° ′	h m
Venus	348 11.5	14 26
Marte	116 32.6	5 54
Júpiter	299 12.3	17 41
Saturno	306 54.8	17 10

T.U.	SOL				LUNA					
	A.H.G.		Dec.		A.H.G.	v	Dec.	d	P.H.	
d h	° ′		° ′		° ′	′	° ′	′	′	
24 00	176 41.1	S	9 31.0		168 16.3	14.7	S10 50.2	10.4	54.4	
01	191 41.2		30.1		182 50.0	14.7	10 39.8	10.4	54.4	
02	206 41.3		29.2		197 23.7	14.8	10 29.4	10.4	54.4	
03	221 41.3	. .	28.2		211 57.5	14.7	10 19.0	10.5	54.4	
04	236 41.4		27.3		226 31.2	14.8	10 08.5	10.5	54.4	
05	251 41.5		26.4		241 05.0	14.8	9 58.0	10.6	54.5	
06	266 41.6	S	9 25.5		255 38.8	14.8	S 9 47.4	10.6	54.5	
07	281 41.7		24.5		270 12.6	14.9	9 36.8	10.7	54.5	
S 08	296 41.8		23.6		284 46.5	14.8	9 26.1	10.7	54.5	
A 09	311 41.9	. .	22.7		299 20.3	14.9	9 15.4	10.7	54.5	
B 10	326 42.0		21.8		313 54.2	14.9	9 04.7	10.8	54.5	
A 11	341 42.1		20.8		328 28.1	14.9	8 53.9	10.8	54.5	
12	356 42.2	S	9 19.9		343 02.0	15.0	S 8 43.1	10.9	54.5	
D 13	11 42.3		19.0		357 36.0	14.9	8 32.2	10.9	54.6	
O 14	26 42.4		18.1		12 09.9	15.0	8 21.3	11.0	54.6	
15	41 42.5	. .	17.1		26 43.9	14.9	8 10.3	11.0	54.6	
16	56 42.6		16.2		41 17.8	15.0	7 59.3	11.0	54.6	
17	71 42.6		15.3		55 51.8	15.0	7 48.3	11.1	54.6	
18	86 42.7	S	9 14.4		70 25.8	15.0	S 7 37.2	11.1	54.6	
19	101 42.8		13.4		84 59.8	15.0	7 26.1	11.1	54.6	
20	116 42.9		12.5		99 33.8	15.1	7 15.0	11.2	54.6	
21	131 43.0	. .	11.6		114 07.9	15.0	7 03.8	11.2	54.7	
22	146 43.1		10.6		128 41.9	15.1	6 52.6	11.2	54.7	
23	161 43.2		09.7		143 16.0	15.0	6 41.4	11.3	54.7	
25 00	176 43.3	S	9 08.8		157 50.0	15.1	S 6 30.1	11.3	54.7	
01	191 43.4		07.9		172 24.1	15.1	6 18.8	11.3	54.7	
02	206 43.5		06.9		186 58.2	15.1	6 07.5	11.4	54.7	
03	221 43.6	. .	06.0		201 32.3	15.1	5 56.1	11.4	54.7	
04	236 43.7		05.1		216 06.4	15.1	5 44.7	11.4	54.8	
05	251 43.8		04.1		230 40.5	15.1	5 33.3	11.4	54.8	
06	266 43.9	S	9 03.2		245 14.6	15.1	S 5 21.9	11.5	54.8	
07	281 44.0		02.3		259 48.7	15.1	5 10.4	11.5	54.8	
D 08	296 44.1		01.3		274 22.8	15.1	4 58.9	11.5	54.8	
O 09	311 44.2		9 00.4		288 56.9	15.1	4 47.4	11.6	54.8	
M 10	326 44.3		8 59.5		303 31.0	15.1	4 35.8	11.6	54.8	
I 11	341 44.4		58.6		318 05.1	15.1	4 24.2	11.6	54.9	
12	356 44.5	S	8 57.6		332 39.2	15.2	S 4 12.6	11.6	54.9	
N 13	11 44.6		56.7		347 13.4	15.1	4 01.0	11.6	54.9	
G 14	26 44.7		55.8		1 47.5	15.1	3 49.4	11.7	54.9	
O 15	41 44.8	. .	54.8		16 21.6	15.1	3 37.7	11.7	54.9	
16	56 44.9		53.9		30 55.7	15.1	3 26.0	11.7	54.9	
17	71 45.0		53.0		45 29.8	15.1	3 14.3	11.8	55.0	
18	86 45.1	S	8 52.0		60 03.9	15.1	S 3 02.5	11.7	55.0	
19	101 45.2		51.1		74 38.0	15.1	2 50.8	11.8	55.0	
20	116 45.3		50.2		89 12.1	15.1	2 39.0	11.8	55.0	
21	131 45.4	. .	49.2		103 46.2	15.1	2 27.2	11.8	55.0	
22	146 45.5		48.3		118 20.3	15.1	2 15.4	11.8	55.0	
23	161 45.6		47.4		132 54.4	15.0	2 03.6	11.8	55.1	
26 00	176 45.7	S	8 46.4		147 28.4	15.1	S 1 51.8	11.9	55.1	
01	191 45.8		45.5		162 02.5	15.1	1 39.9	11.8	55.1	
02	206 45.9		44.6		176 36.6	15.0	1 28.1	11.9	55.1	
03	221 46.0	. .	43.6		191 10.6	15.0	1 16.2	11.9	55.1	
04	236 46.1		42.7		205 44.6	15.0	1 04.3	11.9	55.1	
05	251 46.2		41.8		220 18.6	15.0	0 52.4	11.9	55.2	
06	266 46.3	S	8 40.8		234 52.6	15.0	S 0 40.5	11.9	55.2	
07	281 46.4		39.9		249 26.6	15.0	0 28.6	12.0	55.2	
08	296 46.5		38.9		264 00.6	15.0	0 16.6	11.9	55.2	
L 09	311 46.7	. .	38.0		278 34.6	14.9	S 0 04.7	11.9	55.2	
U 10	326 46.8		37.1		293 08.5	14.9	N 0 07.2	12.0	55.2	
N 11	341 46.9		36.1		307 42.4	15.0	0 19.2	11.9	55.3	
12	356 47.0	S	8 35.2		322 16.4	14.8	N 0 31.1	12.0	55.3	
E 13	11 47.1		34.3		336 50.2	14.9	0 43.1	12.0	55.3	
S 14	26 47.2		33.3		351 24.1	14.9	0 55.1	11.9	55.3	
15	41 47.3	. .	32.4		5 58.0	14.8	1 07.0	12.0	55.3	
16	56 47.4		31.4		20 31.8	14.8	1 19.0	12.0	55.4	
17	71 47.5		30.5		35 05.6	14.8	1 31.0	12.0	55.4	
18	86 47.6	S	8 29.6		49 39.4	14.8	N 1 43.0	11.9	55.4	
19	101 47.7		28.6		64 13.2	14.7	1 54.9	12.0	55.4	
20	116 47.8		27.7		78 46.9	14.7	2 06.9	12.0	55.4	
21	131 47.9	. .	26.8		93 20.6	14.7	2 18.9	12.0	55.5	
22	146 48.0		25.8		107 54.3	14.7	2 30.9	11.9	55.5	
23	161 48.1		24.9		122 28.0	14.6	N 2 42.8	12.0	55.5	
	SD 16.2	d	0.9		SD 14.9		15.0		15.1	

Lat.	Crepúsculo Náutico	Crepúsculo Civil	Orto Sol	Orto Luna 24	Orto Luna 25	Orto Luna 26	Orto Luna 27
°	h m	h m	h m	h m	h m	h m	h m
N 72	05 29	06 47	07 58	09 04	08 45	08 28	08 11
N 70	05 32	06 42	07 46	08 50	08 39	08 28	08 17
68	05 35	06 39	07 36	08 39	08 33	08 28	08 22
66	05 36	06 35	07 28	08 30	08 29	08 27	08 26
64	05 38	06 33	07 21	08 22	08 25	08 27	08 30
62	05 39	06 30	07 15	08 15	08 21	08 27	08 33
60	05 40	06 28	07 10	08 09	08 18	08 27	08 36
N 58	05 40	06 26	07 05	08 03	08 15	08 27	08 38
56	05 41	06 24	07 01	07 59	08 13	08 27	08 40
54	05 41	06 22	06 58	07 54	08 11	08 26	08 42
52	05 41	06 20	06 54	07 51	08 09	08 26	08 44
50	05 41	06 19	06 51	07 47	08 07	08 26	08 46
45	05 41	06 15	06 45	07 39	08 03	08 26	08 49
N 40	05 41	06 12	06 39	07 33	08 00	08 26	08 52
35	05 40	06 09	06 35	07 27	07 57	08 26	08 55
30	05 38	06 06	06 30	07 23	07 54	08 26	08 57
20	05 35	06 01	06 23	07 14	07 50	08 25	09 01
N 10	05 30	05 55	06 16	07 07	07 46	08 25	09 05
0	05 24	05 49	06 10	07 00	07 42	08 25	09 08
S 10	05 17	05 42	06 03	06 52	07 39	08 25	09 12
20	05 08	05 34	05 56	06 45	07 35	08 25	09 16
30	04 55	05 24	05 48	06 36	07 30	08 25	09 20
35	04 47	05 17	05 43	06 31	07 28	08 25	09 22
40	04 37	05 10	05 38	06 26	07 25	08 25	09 25
45	04 24	05 01	05 32	06 19	07 21	08 24	09 29
S 50	04 08	04 50	05 24	06 11	07 17	08 24	09 32
52	04 01	04 45	05 20	06 07	07 15	08 24	09 34
54	03 52	04 39	05 16	06 03	07 13	08 24	09 36
56	03 42	04 32	05 12	05 59	07 11	08 24	09 39
58	03 30	04 25	05 07	05 54	07 09	08 24	09 41
S 60	03 16	04 16	05 02	05 48	07 06	08 24	09 44

Lat.	Ocaso Sol	Crepúsculo Civil	Crepúsculo Náutico	Ocaso Luna 24	Ocaso Luna 25	Ocaso Luna 26	Ocaso Luna 27
°	h m	h m	h m	h m	h m	h m	h m
N 72	16 30	17 41	19 00	17 38	19 27	21 15	23 07
N 70	16 42	17 46	18 56	17 50	19 31	21 12	22 55
68	16 52	17 49	18 54	18 00	19 34	21 09	22 46
66	17 00	17 52	18 52	18 08	19 37	21 07	22 39
64	17 06	17 55	18 50	18 14	19 39	21 05	22 33
62	17 12	17 57	18 49	18 20	19 41	21 03	22 27
60	17 17	18 00	18 48	18 25	19 43	21 02	22 22
N 58	17 22	18 02	18 47	18 30	19 45	21 01	22 18
56	17 26	18 03	18 46	18 33	19 46	21 00	22 15
54	17 29	18 05	18 46	18 37	19 47	20 59	22 11
52	17 32	18 07	18 46	18 40	19 48	20 58	22 08
50	17 35	18 08	18 46	18 43	19 49	20 57	22 06
45	17 42	18 12	18 46	18 49	19 52	20 55	22 00
N 40	17 47	18 15	18 46	18 54	19 54	20 54	21 55
35	17 52	18 18	18 47	18 59	19 55	20 52	21 51
30	17 56	18 20	18 48	19 02	19 56	20 51	21 47
20	18 04	18 26	18 51	19 09	19 59	20 49	21 41
N 10	18 10	18 31	18 56	19 15	20 01	20 47	21 35
0	18 16	18 37	19 02	19 20	20 03	20 46	21 30
S 10	18 23	18 44	19 09	19 26	20 05	20 44	21 25
20	18 30	18 52	19 18	19 31	20 07	20 42	21 19
30	18 38	19 02	19 31	19 38	20 09	20 40	21 13
35	18 42	19 08	19 39	19 41	20 10	20 39	21 09
40	18 47	19 15	19 49	19 45	20 12	20 38	21 05
45	18 54	19 24	20 01	19 50	20 13	20 36	21 00
S 50	19 01	19 35	20 16	19 56	20 15	20 35	20 55
52	19 05	19 40	20 24	19 59	20 16	20 34	20 52
54	19 08	19 46	20 32	20 01	20 17	20 33	20 49
56	19 13	19 52	20 42	20 05	20 18	20 32	20 46
58	19 17	20 00	20 54	20 08	20 20	20 31	20 43
S 60	19 23	20 08	21 07	20 12	20 21	20 30	20 39

Día	SOL E.T. (−) 00h	SOL E.T. (−) 12h	SOL Pas. Mer.	LUNA Pas. Mer. Sup.	LUNA Mer. Inf.	Edad	Fase
d	m s	m s	h m	h m	h m	d	%
24	**13 16**	**13 11**	12 13	13 10	00 48	01	1
25	**13 07**	**13 02**	12 13	13 53	01 31	02	4
26	**12 57**	**12 52**	12 13	14 35	02 14	03	9

T.U.	ARIES	VENUS −4.6		MARTE +0.5		JUPITER −2.3		SATURNO +0.2	
	A.H.G.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
27 00	156 53.6	144 28.5	N11 14.2	272 23.6	S20 28.1	95 53.3	N20 10.6	103 41.5	N17 09.2
01	171 56.0	159 30.3	15.0	287 24.8	28.3	110 55.5	10.6	118 43.8	09.2
02	186 58.5	174 32.1	15.7	302 25.9	28.5	125 57.7	10.7	133 46.1	09.3
03	202 00.9	189 33.8	. . 16.4	317 27.1	. . 28.8	140 59.9	. . 10.7	148 48.5	. . 09.3
04	217 03.4	204 35.6	17.2	332 28.3	29.0	156 02.1	10.8	163 50.8	09.3
05	232 05.9	219 37.4	17.9	347 29.4	29.3	171 04.3	10.9	178 53.1	09.4
06	247 08.3	234 39.2	N11 18.6	2 30.6	S20 29.5	186 06.5	N20 10.9	193 55.4	N17 09.4
07	262 10.8	249 41.0	19.4	17 31.8	29.7	201 08.7	11.0	208 57.7	09.5
M 08	277 13.3	264 42.8	20.1	32 33.0	30.0	216 10.9	11.0	224 00.0	09.5
A 09	292 15.7	279 44.6	. . 20.8	47 34.1	. . 30.2	231 13.1	. . 11.1	239 02.4	. . 09.6
R 10	307 18.2	294 46.4	21.6	62 35.3	30.5	246 15.3	11.2	254 04.7	09.6
T 11	322 20.7	309 48.2	22.3	77 36.5	30.7	261 17.5	11.2	269 07.0	09.7
E 12	337 23.1	324 50.0	N11 23.0	92 37.6	S20 30.9	276 19.7	N20 11.3	284 09.3	N17 09.7
S 13	352 25.6	339 51.8	23.7	107 38.8	31.2	291 21.9	11.3	299 11.6	09.8
14	7 28.0	354 53.6	24.5	122 40.0	31.4	306 24.1	11.4	314 13.9	09.8
15	22 30.5	9 55.4	. . 25.2	137 41.1	. . 31.7	321 26.3	. . 11.5	329 16.2	. . 09.8
16	37 33.0	24 57.3	25.9	152 42.3	31.9	336 28.5	11.5	344 18.6	09.9
17	52 35.4	39 59.1	26.6	167 43.5	32.1	351 30.6	11.6	359 20.9	09.9
18	67 37.9	55 00.9	N11 27.4	182 44.7	S20 32.4	6 32.8	N20 11.6	14 23.2	N17 10.0
19	82 40.4	70 02.7	28.1	197 45.8	32.6	21 35.0	11.7	29 25.5	10.0
20	97 42.8	85 04.6	28.8	212 47.0	32.8	36 37.2	11.8	44 27.8	10.1
21	112 45.3	100 06.4	. . 29.5	227 48.2	. . 33.1	51 39.4	. . 11.8	59 30.1	. . 10.1
22	127 47.8	115 08.2	30.2	242 49.3	33.3	66 41.6	11.9	74 32.4	10.2
23	142 50.2	130 10.1	30.9	257 50.5	33.6	81 43.8	11.9	89 34.7	10.2
28 00	157 52.7	145 11.9	N11 31.6	272 51.7	S20 33.8	96 46.0	N20 12.0	104 37.1	N17 10.3
01	172 55.2	160 13.8	32.3	287 52.9	34.0	111 48.2	12.0	119 39.4	10.3
02	187 57.6	175 15.6	33.0	302 54.0	34.3	126 50.4	12.1	134 41.7	10.4
03	203 00.1	190 17.5	. . 33.8	317 55.2	. . 34.5	141 52.5	. . 12.2	149 44.0	. . 10.4
04	218 02.5	205 19.3	34.5	332 56.4	34.7	156 54.7	12.2	164 46.3	10.5
05	233 05.0	220 21.2	35.2	347 57.6	35.0	171 56.9	12.3	179 48.6	10.5
06	248 07.5	235 23.1	N11 35.9	2 58.7	S20 35.2	186 59.1	N20 12.3	194 50.9	N17 10.5
M 07	263 09.9	250 24.9	36.6	17 59.9	35.5	202 01.3	12.4	209 53.2	10.6
I 08	278 12.4	265 26.8	37.3	33 01.1	35.7	217 03.5	12.5	224 55.6	10.6
E 09	293 14.9	280 28.7	. . 38.0	48 02.3	. . 35.9	232 05.7	. . 12.5	239 57.9	. . 10.7
R 10	308 17.3	295 30.6	38.7	63 03.4	36.2	247 07.9	12.6	255 00.2	10.7
C 11	323 19.8	310 32.4	39.3	78 04.6	36.4	262 10.1	12.6	270 02.5	10.8
O 12	338 22.3	325 34.3	N11 40.0	93 05.8	S20 36.6	277 12.2	N20 12.7	285 04.8	N17 10.8
L 13	353 24.7	340 36.2	40.7	108 07.0	36.9	292 14.4	12.8	300 07.1	10.9
E 14	8 27.2	355 38.1	41.4	123 08.1	37.1	307 16.6	12.8	315 09.4	10.9
S 15	23 29.7	10 40.0	. . 42.1	138 09.3	. . 37.3	322 18.8	. . 12.9	330 11.7	. . 11.0
16	38 32.1	25 41.9	42.8	153 10.5	37.6	337 21.0	12.9	345 14.0	11.0
17	53 34.6	40 43.8	43.5	168 11.7	37.8	352 23.2	13.0	0 16.3	11.1
18	68 37.0	55 45.7	N11 44.2	183 12.9	S20 38.0	7 25.3	N20 13.1	15 18.7	N17 11.1
19	83 39.5	70 47.6	44.8	198 14.0	38.3	22 27.5	13.1	30 21.0	11.2
20	98 42.0	85 49.5	45.5	213 15.2	38.5	37 29.7	13.2	45 23.3	11.2
21	113 44.4	100 51.4	. . 46.2	228 16.4	. . 38.7	52 31.9	. . 13.2	60 25.6	. . 11.3
22	128 46.9	115 53.3	46.9	243 17.6	39.0	67 34.1	13.3	75 27.9	11.3
23	143 49.4	130 55.2	47.6	258 18.7	39.2	82 36.3	13.4	90 30.2	11.3
1 00	158 51.8	145 57.1	N11 48.2	273 19.9	S20 39.4	97 38.5	N20 13.4	105 32.5	N17 11.4
01	173 54.3	160 59.1	48.9	288 21.1	39.7	112 40.6	13.5	120 34.8	11.4
02	188 56.8	176 01.0	49.6	303 22.3	39.9	127 42.8	13.6	135 37.1	11.5
03	203 59.2	191 02.9	. . 50.3	318 23.5	. . 40.1	142 45.0	. . 13.6	150 39.4	. . 11.5
04	219 01.7	206 04.9	50.9	333 24.6	40.4	157 47.2	13.7	165 41.7	11.6
05	234 04.1	221 06.8	51.6	348 25.8	40.6	172 49.4	13.7	180 44.1	11.6
06	249 06.6	236 08.7	N11 52.3	3 27.0	S20 40.8	187 51.5	N20 13.8	195 46.4	N17 11.7
07	264 09.1	251 10.7	52.9	18 28.2	41.0	202 53.7	13.9	210 48.7	11.7
J 08	279 11.5	266 12.6	53.6	33 29.4	41.3	217 55.9	13.9	225 51.0	11.8
U 09	294 14.0	281 14.6	. . 54.3	48 30.5	. . 41.5	232 58.1	. . 14.0	240 53.3	. . 11.8
E 10	309 16.5	296 16.5	54.9	63 31.7	41.7	248 00.3	14.0	255 55.6	11.9
V 11	324 18.9	311 18.5	55.6	78 32.9	42.0	263 02.4	14.1	270 57.9	11.9
E 12	339 21.4	326 20.4	N11 56.2	93 34.1	S20 42.2	278 04.6	N20 14.2	286 00.2	N17 12.0
S 13	354 23.9	341 22.4	56.9	108 35.3	42.4	293 06.8	14.2	301 02.5	12.0
14	9 26.3	356 24.4	57.6	123 36.5	42.7	308 09.0	14.3	316 04.8	12.1
15	24 28.8	11 26.3	. . 58.2	138 37.6	. . 42.9	323 11.2	. . 14.3	331 07.1	. . 12.1
16	39 31.3	26 28.3	58.9	153 38.8	43.1	338 13.3	14.4	346 09.4	12.2
17	54 33.7	41 30.3	11 59.5	168 40.0	43.3	353 15.5	14.5	1 11.7	12.2
18	69 36.2	56 32.3	N12 00.2	183 41.2	S20 43.6	8 17.7	N20 14.5	16 14.0	N17 12.3
19	84 38.6	71 34.3	00.8	198 42.4	43.8	23 19.9	14.6	31 16.3	12.3
20	99 41.1	86 36.2	01.5	213 43.6	44.0	38 22.0	14.6	46 18.6	12.4
21	114 43.6	101 38.2	. . 02.1	228 44.7	. . 44.3	53 24.2	. . 14.7	61 21.0	. . 12.4
22	129 46.0	116 40.2	02.7	243 45.9	44.5	68 26.4	14.8	76 23.3	12.4
23	144 48.5	131 42.2	03.4	258 47.1	44.7	83 28.6	14.8	91 25.6	12.5
	h m								
Pas. Mer.	13 26.3	v 1.9	d 0.7	v 1.2	d 0.2	v 2.2	d 0.1	v 2.3	d 0.0

ESTRELLAS

Nombre	A.H.S.	Dec.
	° ′	° ′
Acamar	315 25.8	S40 18.4
Achernar	335 34.3	S57 14.2
Acrux	173 19.6	S63 06.1
Adhara	255 19.9	S28 58.7
Aldebaran	291 00.5	N16 30.6
Alioth	166 28.6	N55 57.1
Alkaid	153 06.1	N49 18.3
Al Na'ir	27 56.2	S46 57.5
Alnilam	275 56.1	S 1 12.2
Alphard	218 05.3	S 8 39.9
Alphecca	126 19.1	N26 42.5
Alpheratz	357 53.8	N29 05.7
Altair	62 17.9	N 8 52.1
Ankaa	353 25.5	S42 18.3
Antares	112 38.1	S26 26.0
Arcturus	146 04.3	N19 10.5
Atria	107 48.7	S69 01.5
Avior	234 21.5	S59 31.0
Bellatrix	278 42.3	N 6 20.9
Betelgeuse	271 11.6	N 7 24.3
Canopus	264 00.2	S52 42.1
Capella	280 48.6	N46 00.0
Deneb	49 38.5	N45 16.8
Denebola	182 43.2	N14 33.9
Diphda	349 05.8	S17 59.1
Dubhe	194 02.7	N61 44.7
Elnath	278 24.7	N28 36.5
Eltanin	90 50.8	N51 29.0
Enif	33 56.9	N 9 52.6
Fomalhaut	15 34.9	S29 37.2
Gacrux	172 11.3	S57 07.0
Gienah	176 02.0	S17 32.9
Hadar	149 01.3	S60 22.4
Hamal	328 11.9	N23 28.0
Kaus Aust.	83 56.8	S34 23.0
Kochab	137 19.0	N74 08.8
Markab	13 48.3	N15 12.5
Menkar	314 25.3	N 4 05.5
Menkent	148 18.8	S36 22.4
Miaplacidus	221 41.0	S69 43.4
Mirfak	308 54.4	N49 52.0
Nunki	76 10.5	S26 17.7
Peacock	53 34.8	S56 43.9
Pollux	243 39.2	N28 01.4
Procyon	245 09.6	N 5 13.2
Rasalhague	96 15.5	N12 33.4
Regulus	207 53.4	N11 57.7
Rigel	281 21.3	S 8 12.2
Rigil Kent.	140 04.8	S60 50.1
Sabik	102 23.7	S15 43.6
Schedar	349 52.1	N56 32.6
Shaula	96 35.1	S37 06.2
Sirius	258 42.1	S16 43.3
Spica	158 41.2	S11 10.0
Suhail	222 59.2	S43 26.3
Vega	80 45.7	N38 46.8
Zuben'ubi	137 16.0	S16 02.7

	A.H.S.	Pas. Mer.
	° ′	h m
Venus	347 19.2	14 17
Marte	114 59.0	5 48
Júpiter	298 53.3	17 30
Saturno	306 44.4	16 59

T.U.	SOL			LUNA					
	A.H.G.		Dec.	A.H.G.	v	Dec.	d	P.H.	
d h	° ′		° ′	° ′	′	° ′	′	′	
27 00	176 48.3	S	8 23.9	137 01.6	14.6	N 2 54.8	12.0	55.5	
01	191 48.4		23.0	151 35.2	14.6	3 06.8	11.9	55.5	
02	206 48.5		22.1	166 08.8	14.5	3 18.7	12.0	55.6	
03	221 48.6	. .	21.1	180 42.3	14.5	3 30.7	11.9	55.6	
04	236 48.7		20.2	195 15.8	14.5	3 42.6	12.0	55.6	
05	251 48.8		19.2	209 49.3	14.5	3 54.6	11.9	55.6	
06	266 48.9	S	8 18.3	224 22.8	14.4	N 4 06.5	11.9	55.6	
07	281 49.0		17.4	238 56.2	14.4	4 18.4	11.9	55.7	
M 08	296 49.1		16.4	253 29.6	14.3	4 30.3	11.9	55.7	
A 09	311 49.2	. .	15.5	268 02.9	14.3	4 42.2	11.9	55.7	
10	326 49.4		14.5	282 36.2	14.3	4 54.1	11.9	55.7	
R 11	341 49.5		13.6	297 09.5	14.2	5 06.0	11.8	55.7	
12	356 49.6	S	8 12.6	311 42.7	14.2	N 5 17.8	11.9	55.8	
T 13	11 49.7		11.7	326 15.9	14.2	5 29.7	11.8	55.8	
14	26 49.8		10.8	340 49.1	14.1	5 41.5	11.8	55.8	
E 15	41 49.9	. .	09.8	355 22.2	14.0	5 53.3	11.8	55.8	
S 16	56 50.0		08.9	9 55.2	14.1	6 05.1	11.8	55.9	
17	71 50.1		07.9	24 28.3	14.0	6 16.9	11.8	55.9	
18	86 50.3	S	8 07.0	39 01.3	13.9	N 6 28.7	11.7	55.9	
19	101 50.4		06.0	53 34.2	13.9	6 40.4	11.7	55.9	
20	116 50.5		05.1	68 07.1	13.9	6 52.1	11.7	56.0	
21	131 50.6	. .	04.2	82 40.0	13.8	7 03.8	11.7	56.0	
22	146 50.7		03.2	97 12.8	13.7	7 15.5	11.7	56.0	
23	161 50.8		02.3	111 45.5	13.7	7 27.2	11.6	56.0	
28 00	176 50.9	S	8 01.3	126 18.2	13.7	N 7 38.8	11.6	56.0	
01	191 51.0		8 00.4	140 50.9	13.6	7 50.4	11.6	56.1	
02	206 51.2		7 59.4	155 23.5	13.5	8 02.0	11.5	56.1	
03	221 51.3	. .	58.5	169 56.0	13.5	8 13.5	11.5	56.1	
04	236 51.4		57.5	184 28.5	13.5	8 25.0	11.5	56.1	
05	251 51.5		56.6	199 01.0	13.4	8 36.5	11.5	56.2	
06	266 51.6	S	7 55.7	213 33.4	13.3	N 8 48.0	11.4	56.2	
M 07	281 51.7		54.7	228 05.7	13.3	8 59.4	11.5	56.2	
I 08	296 51.9		53.8	242 38.0	13.2	9 10.9	11.3	56.2	
E 09	311 52.0	. .	52.8	257 10.2	13.2	9 22.2	11.4	56.3	
R 10	326 52.1		51.9	271 42.4	13.1	9 33.6	11.3	56.3	
C 11	341 52.2		50.9	286 14.5	13.1	9 44.9	11.2	56.3	
O 12	356 52.3	S	7 50.0	300 46.6	13.0	N 9 56.1	11.3	56.3	
L 13	11 52.4		49.0	315 18.6	12.9	10 07.4	11.2	56.4	
E 14	26 52.6		48.1	329 50.5	12.9	10 18.6	11.1	56.4	
S 15	41 52.7	. .	47.1	344 22.4	12.8	10 29.7	11.1	56.4	
16	56 52.8		46.2	358 54.2	12.8	10 40.8	11.1	56.4	
17	71 52.9		45.2	13 26.0	12.7	10 51.9	11.0	56.5	
18	86 53.0	S	7 44.3	27 57.7	12.6	N11 02.9	11.0	56.5	
19	101 53.2		43.3	42 29.3	12.5	11 13.9	11.0	56.5	
20	116 53.3		42.4	57 00.8	12.5	11 24.9	10.9	56.5	
21	131 53.4	. .	41.4	71 32.3	12.4	11 35.8	10.8	56.6	
22	146 53.5		40.5	86 03.7	12.4	11 46.6	10.9	56.6	
23	161 53.6		39.5	100 35.1	12.3	11 57.5	10.7	56.6	
1 00	176 53.7	S	7 38.6	115 06.4	12.2	N12 08.2	10.7	56.6	
01	191 53.9		37.6	129 37.6	12.1	12 18.9	10.7	56.7	
02	206 54.0		36.7	144 08.7	12.1	12 29.6	10.6	56.7	
03	221 54.1	. .	35.7	158 39.8	12.0	12 40.2	10.6	56.7	
04	236 54.2		34.8	173 10.8	12.0	12 50.8	10.5	56.8	
05	251 54.4		33.8	187 41.8	11.8	13 01.3	10.5	56.8	
06	266 54.5	S	7 32.9	202 12.6	11.8	N13 11.8	10.4	56.8	
07	281 54.6		31.9	216 43.4	11.7	13 22.2	10.3	56.8	
J 08	296 54.7		31.0	231 14.1	11.6	13 32.5	10.3	56.9	
U 09	311 54.8	. .	30.0	245 44.7	11.6	13 42.8	10.2	56.9	
E 10	326 55.0		29.1	260 15.3	11.5	13 53.0	10.2	56.9	
V 11	341 55.1		28.1	274 45.8	11.4	14 03.2	10.1	56.9	
12	356 55.2	S	7 27.2	289 16.2	11.3	N14 13.3	10.1	57.0	
E 13	11 55.3		26.2	303 46.5	11.3	14 23.4	9.9	57.0	
14	26 55.5		25.3	318 16.8	11.1	14 33.3	10.0	57.0	
S 15	41 55.6	. .	24.3	332 46.9	11.1	14 43.3	9.8	57.1	
16	56 55.7		23.4	347 17.0	11.0	14 53.1	9.8	57.1	
17	71 55.8		22.4	1 47.0	11.0	15 02.9	9.7	57.1	
18	86 55.9	S	7 21.5	16 17.0	10.8	N15 12.6	9.7	57.1	
19	101 56.1		20.5	30 46.8	10.8	15 22.3	9.6	57.2	
20	116 56.2		19.6	45 16.6	10.7	15 31.9	9.5	57.2	
21	131 56.3	. .	18.6	59 46.3	10.6	15 41.4	9.4	57.2	
22	146 56.4		17.7	74 15.9	10.5	15 50.8	9.4	57.3	
23	161 56.6		16.7	88 45.4	10.4	N16 00.2	9.3	57.3	
	SD 16.2	d	0.9	SD	15.2	15.3		15.5	

Lat.	Crepúsculo Náutico	Crepúsculo Civil	Orto Sol	Orto Luna 27	Orto Luna 28	Orto Luna 1	Orto Luna 2
°	h m	h m	h m	h m	h m	h m	h m
N 72	05 15	06 32	07 42	08 11	07 52	07 27	06 39
N 70	05 19	06 29	07 32	08 17	08 05	07 51	07 31
68	05 23	06 27	07 23	08 22	08 16	08 10	08 03
66	05 26	06 25	07 17	08 26	08 26	08 26	08 27
64	05 28	06 23	07 11	08 30	08 33	08 38	08 46
62	05 30	06 21	07 06	08 33	08 40	08 49	09 02
60	05 31	06 19	07 01	08 36	08 46	08 58	09 15
N 58	05 33	06 18	06 57	08 38	08 51	09 06	09 26
56	05 34	06 17	06 54	08 40	08 55	09 13	09 36
54	05 35	06 15	06 51	08 42	09 00	09 20	09 45
52	05 35	06 14	06 48	08 44	09 03	09 25	09 52
50	05 36	06 13	06 45	08 46	09 07	09 31	10 00
45	05 36	06 10	06 40	08 49	09 14	09 42	10 15
N 40	05 36	06 08	06 35	08 52	09 21	09 52	10 27
35	05 36	06 05	06 31	08 55	09 26	10 00	10 38
30	05 35	06 03	06 27	08 57	09 31	10 07	10 47
20	05 33	05 58	06 21	09 01	09 39	10 19	11 04
N 10	05 29	05 54	06 15	09 05	09 46	10 30	11 18
0	05 24	05 48	06 09	09 08	09 53	10 41	11 31
S 10	05 18	05 42	06 04	09 12	10 00	10 51	11 45
20	05 09	05 35	05 57	09 16	10 08	11 02	12 00
30	04 57	05 26	05 50	09 20	10 17	11 15	12 16
35	04 50	05 20	05 46	09 22	10 22	11 23	12 26
40	04 40	05 14	05 41	09 25	10 27	11 31	12 37
45	04 29	05 05	05 36	09 29	10 34	11 42	12 51
S 50	04 14	04 55	05 29	09 32	10 42	11 54	13 07
52	04 07	04 51	05 26	09 34	10 46	11 59	13 14
54	03 59	04 45	05 22	09 36	10 50	12 06	13 23
56	03 50	04 39	05 19	09 39	10 55	12 13	13 32
58	03 39	04 33	05 14	09 41	11 00	12 21	13 43
S 60	03 27	04 25	05 10	09 44	11 06	12 30	13 56

Lat.	Ocaso Sol	Crepúsculo Civil	Crepúsculo Náutico	Ocaso Luna 27	Ocaso Luna 28	Ocaso Luna 1	Ocaso Luna 2
°	h m	h m	h m	h m	h m	h m	h m
N 72	16 45	17 55	19 13	23 07	25 09	01 09	03 40
N 70	16 55	17 58	19 08	22 55	24 46	00 46	02 50
68	17 03	18 00	19 04	22 46	24 29	00 29	02 18
66	17 10	18 02	19 01	22 39	24 15	00 15	01 55
64	17 16	18 04	18 59	22 33	24 03	00 03	01 37
62	17 21	18 05	18 57	22 27	23 53	25 23	01 23
60	17 25	18 07	18 55	22 22	23 45	25 10	01 10
N 58	17 29	18 08	18 54	22 18	23 38	25 00	01 00
56	17 32	18 10	18 53	22 15	23 32	24 50	00 50
54	17 35	18 11	18 52	22 11	23 26	24 42	00 42
52	17 38	18 12	18 51	22 08	23 21	24 35	00 35
50	17 40	18 13	18 50	22 06	23 16	24 28	00 28
45	17 46	18 16	18 50	22 00	23 06	24 14	00 14
N 40	17 51	18 18	18 49	21 55	22 58	24 03	00 03
35	17 55	18 20	18 50	21 51	22 51	23 53	24 57
30	17 58	18 22	18 50	21 47	22 45	23 44	24 46
20	18 05	18 27	18 53	21 41	22 34	23 29	24 28
N 10	18 10	18 32	18 56	21 35	22 25	23 17	24 12
0	18 16	18 37	19 01	21 30	22 16	23 05	23 57
S 10	18 21	18 43	19 07	21 25	22 07	22 53	23 42
20	18 27	18 50	19 16	21 19	21 58	22 40	23 26
30	18 34	18 59	19 27	21 13	21 47	22 25	23 08
35	18 38	19 04	19 35	21 09	21 41	22 17	22 58
40	18 43	19 11	19 44	21 05	21 34	22 07	22 46
45	18 48	19 19	19 55	21 00	21 26	21 56	22 32
S 50	18 55	19 28	20 09	20 55	21 17	21 43	22 15
52	18 58	19 33	20 16	20 52	21 12	21 36	22 06
54	19 01	19 38	20 24	20 49	21 07	21 29	21 58
56	19 05	19 44	20 33	20 46	21 02	21 22	21 47
58	19 09	19 51	20 43	20 43	20 56	21 13	21 36
S 60	19 14	19 58	20 56	20 39	20 49	21 03	21 23

Día	SOL E. T. (−) 00h	SOL E. T. (−) 12h	SOL Pas. Mer.	LUNA Pas. Mer. Sup.	LUNA Pas. Mer. Inf.	LUNA Edad	LUNA Fase
d	m s	m s	h m	h m	h m	d %	
27	12 47	12 42	12 13	15 19	02 57	04 16	
28	12 36	12 31	12 13	16 05	03 42	05 24	
1	12 25	12 19	12 12	16 53	04 28	06 33	

T.U.	ARIES	VENUS −4.6		MARTE +0.5		JUPITER −2.3		SATURNO +0.2	
	A.H.G.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
2 00	159 51.0	146 44.2	N12 04.0	273 48.3	S20 44.9	98 30.8	N20 14.9	106 27.9	N17 12.5
01	174 53.4	161 46.2	04.7	288 49.5	45.2	113 32.9	15.0	121 30.2	12.6
02	189 55.9	176 48.2	05.3	303 50.7	45.4	128 35.1	15.0	136 32.5	12.6
03	204 58.4	191 50.2 . .	05.9	318 51.8 . .	45.6	143 37.3 . .	15.1	151 34.8 . .	12.7
04	220 00.8	206 52.2	06.6	333 53.0	45.9	158 39.5	15.1	166 37.1	12.7
05	235 03.3	221 54.3	07.2	348 54.2	46.1	173 41.6	15.2	181 39.4	12.8
06	250 05.8	236 56.3	N12 07.8	3 55.4	S20 46.3	188 43.8	N20 15.3	196 41.7	N17 12.8
07	265 08.2	251 58.3	08.5	18 56.6	46.5	203 46.0	15.3	211 44.0	12.9
08	280 10.7	267 00.3	09.1	33 57.8	46.8	218 48.1	15.4	226 46.3	12.9
V 09	295 13.1	282 02.4 . .	09.7	48 59.0 . .	47.0	233 50.3 . .	15.5	241 48.6 . .	13.0
I 10	310 15.6	297 04.4	10.4	64 00.2	47.2	248 52.5	15.5	256 50.9	13.0
E 11	325 18.1	312 06.4	11.0	79 01.3	47.4	263 54.7	15.6	271 53.2	13.1
R 12	340 20.5	327 08.5	N12 11.6	94 02.5	S20 47.7	278 56.8	N20 15.6	286 55.5	N17 13.1
N 13	355 23.0	342 10.5	12.2	109 03.7	47.9	293 59.0	15.7	301 57.8	13.2
E 14	10 25.5	357 12.5	12.8	124 04.9	48.1	309 01.2	15.8	317 00.1	13.2
S 15	25 27.9	12 14.6 . .	13.5	139 06.1 . .	48.3	324 03.4 . .	15.8	332 02.4 . .	13.3
16	40 30.4	27 16.6	14.1	154 07.3	48.6	339 05.5	15.9	347 04.7	13.3
17	55 32.9	42 18.7	14.7	169 08.5	48.8	354 07.7	15.9	2 07.0	13.4
18	70 35.3	57 20.8	N12 15.3	184 09.7	S20 49.0	9 09.9	N20 16.0	17 09.3	N17 13.4
19	85 37.8	72 22.8	15.9	199 10.9	49.2	24 12.0	16.1	32 11.6	13.5
20	100 40.2	87 24.9	16.5	214 12.0	49.5	39 14.2	16.1	47 13.9	13.5
21	115 42.7	102 27.0 . .	17.1	229 13.2 . .	49.7	54 16.4 . .	16.2	62 16.2 . .	13.6
22	130 45.2	117 29.0	17.7	244 14.4	49.9	69 18.5	16.3	77 18.5	13.6
23	145 47.6	132 31.1	18.3	259 15.6	50.1	84 20.7	16.3	92 20.8	13.7
3 00	160 50.1	147 33.2	N12 18.9	274 16.8	S20 50.4	99 22.9	N20 16.4	107 23.1	N17 13.7
01	175 52.6	162 35.3	19.5	289 18.0	50.6	114 25.1	16.4	122 25.4	13.8
02	190 55.0	177 37.4	20.1	304 19.2	50.8	129 27.2	16.5	137 27.7	13.8
03	205 57.5	192 39.4 . .	20.7	319 20.4 . .	51.0	144 29.4 . .	16.6	152 30.0 . .	13.9
04	221 00.0	207 41.5	21.3	334 21.6	51.3	159 31.6	16.6	167 32.3	13.9
05	236 02.4	222 43.6	21.9	349 22.8	51.5	174 33.7	16.7	182 34.6	14.0
06	251 04.9	237 45.7	N12 22.5	4 24.0	S20 51.7	189 35.9	N20 16.8	197 36.9	N17 14.0
07	266 07.4	252 47.8	23.1	19 25.2	51.9	204 38.1	16.8	212 39.2	14.1
S 08	281 09.8	267 49.9	23.7	34 26.3	52.1	219 40.2	16.9	227 41.5	14.1
A 09	296 12.3	282 52.1 . .	24.3	49 27.5 . .	52.4	234 42.4 . .	16.9	242 43.8 . .	14.2
B 10	311 14.7	297 54.2	24.9	64 28.7	52.6	249 44.6	17.0	257 46.1	14.2
11	326 17.2	312 56.3	25.5	79 29.9	52.8	264 46.7	17.1	272 48.4	14.3
A 12	341 19.7	327 58.4	N12 26.1	94 31.1	S20 53.0	279 48.9	N20 17.1	287 50.7	N17 14.3
D 13	356 22.1	343 00.5	26.6	109 32.3	53.3	294 51.1	17.2	302 53.0	14.4
14	11 24.6	358 02.7	27.2	124 33.5	53.5	309 53.2	17.3	317 55.3	14.4
O 15	26 27.1	13 04.8 . .	27.8	139 34.7 . .	53.7	324 55.4 . .	17.3	332 57.6 . .	14.5
16	41 29.5	28 06.9	28.4	154 35.9	53.9	339 57.5	17.4	347 59.9	14.5
17	56 32.0	43 09.1	29.0	169 37.1	54.1	354 59.7	17.5	3 02.2	14.6
18	71 34.5	58 11.2	N12 29.5	184 38.3	S20 54.4	10 01.9	N20 17.5	18 04.5	N17 14.6
19	86 36.9	73 13.3	30.1	199 39.5	54.6	25 04.0	17.6	33 06.8	14.7
20	101 39.4	88 15.5	30.7	214 40.7	54.8	40 06.2	17.6	48 09.1	14.7
21	116 41.9	103 17.6 . .	31.2	229 41.9 . .	55.0	55 08.4 . .	17.7	63 11.4 . .	14.8
22	131 44.3	118 19.8	31.8	244 43.1	55.2	70 10.5	17.8	78 13.7	14.8
23	146 46.8	133 22.0	32.4	259 44.3	55.5	85 12.7	17.8	93 16.0	14.9
4 00	161 49.2	148 24.1	N12 32.9	274 45.5	S20 55.7	100 14.9	N20 17.9	108 18.3	N17 14.9
01	176 51.7	163 26.3	33.5	289 46.7	55.9	115 17.0	18.0	123 20.6	15.0
02	191 54.2	178 28.5	34.1	304 47.9	56.1	130 19.2	18.0	138 22.9	15.0
03	206 56.6	193 30.6 . .	34.6	319 49.1 . .	56.3	145 21.3 . .	18.1	153 25.2 . .	15.1
04	221 59.1	208 32.8	35.2	334 50.3	56.5	160 23.5	18.2	168 27.5	15.1
05	237 01.6	223 35.0	35.7	349 51.5	56.8	175 25.7	18.2	183 29.8	15.2
06	252 04.0	238 37.2	N12 36.3	4 52.7	S20 57.0	190 27.8	N20 18.3	198 32.1	N17 15.2
07	267 06.5	253 39.4	36.8	19 53.9	57.2	205 30.0	18.3	213 34.4	15.3
08	282 09.0	268 41.5	37.4	34 55.1	57.4	220 32.1	18.4	228 36.7	15.3
D 09	297 11.4	283 43.7 . .	37.9	49 56.3 . .	57.6	235 34.3 . .	18.5	243 38.9 . .	15.4
O 10	312 13.9	298 45.9	38.5	64 57.5	57.9	250 36.5	18.5	258 41.2	15.4
M 11	327 16.4	313 48.1	39.0	79 58.7	58.1	265 38.6	18.6	273 43.5	15.5
I 12	342 18.8	328 50.3	N12 39.6	94 59.9	S20 58.3	280 40.8	N20 18.7	288 45.8	N17 15.5
N 13	357 21.3	343 52.6	40.1	110 01.1	58.5	295 42.9	18.7	303 48.1	15.6
G 14	12 23.7	358 54.8	40.7	125 02.3	58.7	310 45.1	18.8	318 50.4	15.6
O 15	27 26.2	13 57.0 . .	41.2	140 03.5 . .	58.9	325 47.2 . .	18.9	333 52.7 . .	15.7
16	42 28.7	28 59.2	41.7	155 04.7	59.2	340 49.4	18.9	348 55.0	15.7
17	57 31.1	44 01.4	42.3	170 05.9	59.4	355 51.6	19.0	3 57.3	15.8
18	72 33.6	59 03.6	N12 42.8	185 07.1	S20 59.6	10 53.7	N20 19.0	18 59.6	N17 15.8
19	87 36.1	74 05.9	43.3	200 08.3	20 59.8	25 55.9	19.1	34 01.9	15.9
20	102 38.5	89 08.1	43.9	215 09.5	21 00.0	40 58.0	19.2	49 04.2	15.9
21	117 41.0	104 10.3 . .	44.4	230 10.7 . .	00.2	56 00.2 . .	19.2	64 06.5 . .	16.0
22	132 43.5	119 12.6	44.9	245 11.9	00.5	71 02.3	19.3	79 08.8	16.0
23	147 45.9	134 14.8	45.4	260 13.1	00.7	86 04.5	19.4	94 11.1	16.1
	h m								
Pas. Mer.	13 14.5	v 2.1	d 0.6	v 1.2	d 0.2	v 2.2	d 0.1	v 2.3	d 0.0

ESTRELLAS		
Nombre	A.H.S.	Dec.
	° ′	° ′
Acamar	315 25.8	S40 18.4
Achernar	335 34.3	S57 14.2
Acrux	173 19.6	S63 06.2
Adhara	255 19.9	S28 58.7
Aldebaran	291 00.5	N16 30.6
Alioth	166 28.6	N55 57.1
Alkaid	153 06.1	N49 18.3
Al Na'ir	27 56.2	S46 57.5
Alnilam	275 56.1	S 1 12.2
Alphard	218 05.3	S 8 39.9
Alphecca	126 19.0	N26 42.5
Alpheratz	357 53.8	N29 05.6
Altair	62 17.9	N 8 52.1
Ankaa	353 25.5	S42 18.3
Antares	112 38.1	S26 26.0
Arcturus	146 04.3	N19 10.5
Atria	107 48.7	S69 01.5
Avior	234 21.5	S59 31.0
Bellatrix	278 42.3	N 6 20.9
Betelgeuse	271 11.6	N 7 24.3
Canopus	264 00.2	S52 42.1
Capella	280 48.6	N46 00.0
Deneb	49 38.5	N45 16.8
Denebola	182 43.2	N14 33.9
Diphda	349 05.8	S17 59.1
Dubhe	194 02.7	N61 44.7
Elnath	278 24.7	N28 36.5
Eltanin	90 50.8	N51 29.0
Enif	33 56.9	N 9 52.6
Fomalhaut	15 34.9	S29 37.2
Gacrux	172 11.2	S57 07.0
Gienah	176 01.9	S17 32.9
Hadar	149 01.3	S60 22.5
Hamal	328 11.9	N23 27.9
Kaus Aust.	83 56.7	S34 23.0
Kochab	137 19.0	N74 08.8
Markab	13 48.3	N15 12.5
Menkar	314 25.3	N 4 05.5
Menkent	148 18.7	S36 22.4
Miaplacidus	221 41.0	S69 43.4
Mirfak	308 54.4	N49 52.0
Nunki	76 10.4	S26 17.7
Peacock	53 34.8	S56 43.8
Pollux	243 39.2	N28 01.4
Procyon	245 09.6	N 5 13.2
Rasalhague	96 15.5	N12 33.4
Regulus	207 53.4	N11 57.7
Rigel	281 21.3	S 8 12.2
Rigil Kent.	140 04.7	S60 50.1
Sabik	102 23.6	S15 43.6
Schedar	349 52.1	N56 32.6
Shaula	96 35.1	S37 06.2
Sirius	258 42.1	S16 43.3
Spica	158 41.2	S11 10.0
Suhail	222 59.2	S43 26.4
Vega	80 45.7	N38 46.8
Zuben'ubi	137 16.0	S16 02.7

	A.H.S.	Pas. Mer.
	° ′	h m
Venus	346 43.1	14 08
Marte	113 26.7	5 42
Júpiter	298 32.8	17 20
Saturno	306 33.0	16 48

T.U.	SOL				LUNA						
	A.H.G.		Dec.		A.H.G.	v	Dec.		d	P.H.	
d h	° ′		° ′		° ′	′	° ′		′	′	
2 00	176 56.7	S	7 15.8		103 14.8	10.4	N16 09.5		9.2	57.3	
01	191 56.8		14.8		117 44.2	10.2	16 18.7		9.1	57.4	
02	206 56.9		13.9		132 13.4	10.2	16 27.8		9.1	57.4	
03	221 57.1	. .	12.9		146 42.6	10.1	16 36.9		9.0	57.4	
04	236 57.2		11.9		161 11.7	10.0	16 45.9		8.9	57.4	
05	251 57.3		11.0		175 40.7	9.9	16 54.8		8.8	57.5	
06	266 57.5	S	7 10.0		190 09.6	9.9	N17 03.6		8.7	57.5	
07	281 57.6		09.1		204 38.5	9.7	17 12.3		8.7	57.5	
08	296 57.7		08.1		219 07.2	9.7	17 21.0		8.6	57.6	
V 09	311 57.8	. .	07.2		233 35.9	9.5	17 29.6		8.4	57.6	
I 10	326 58.0		06.2		248 04.4	9.5	17 38.0		8.4	57.6	
E 11	341 58.1		05.3		262 32.9	9.4	17 46.4		8.3	57.7	
R 12	356 58.2	S	7 04.3		277 01.3	9.3	N17 54.7		8.3	57.7	
N 13	11 58.3		03.3		291 29.6	9.2	18 03.0		8.1	57.7	
E 14	26 58.5		02.4		305 57.8	9.2	18 11.1		8.0	57.7	
S 15	41 58.6	. .	01.4		320 26.0	9.0	18 19.1		7.9	57.8	
16	56 58.7		7 00.5		334 54.0	8.9	18 27.0		7.9	57.8	
17	71 58.9		6 59.5		349 21.9	8.9	18 34.9		7.7	57.8	
18	86 59.0	S	6 58.6		3 49.8	8.8	N18 42.6		7.7	57.9	
19	101 59.1		57.6		18 17.6	8.7	18 50.3		7.5	57.9	
20	116 59.2		56.7		32 45.3	8.5	18 57.8		7.5	57.9	
21	131 59.4	. .	55.7		47 12.8	8.6	19 05.3		7.3	58.0	
22	146 59.5		54.7		61 40.4	8.4	19 12.6		7.2	58.0	
23	161 59.6		53.8		76 07.8	8.3	19 19.8		7.2	58.0	
3 00	176 59.8	S	6 52.8		90 35.1	8.2	N19 27.0		7.0	58.1	
01	191 59.9		51.9		105 02.3	8.2	19 34.0		6.9	58.1	
02	207 00.0		50.9		119 29.5	8.0	19 40.9		6.9	58.1	
03	222 00.2	. .	49.9		133 56.5	8.0	19 47.8		6.7	58.2	
04	237 00.3		49.0		148 23.5	7.9	19 54.5		6.6	58.2	
05	252 00.4		48.0		162 50.4	7.8	20 01.1		6.4	58.2	
06	267 00.6	S	6 47.1		177 17.2	7.7	N20 07.5		6.4	58.2	
07	282 00.7		46.1		191 43.9	7.6	20 13.9		6.3	58.3	
S 08	297 00.8		45.2		206 10.5	7.5	20 20.2		6.1	58.3	
A 09	312 01.0	. .	44.2		220 37.0	7.4	20 26.3		6.0	58.3	
B 10	327 01.1		43.2		235 03.4	7.4	20 32.3		6.0	58.4	
A 11	342 01.2		42.3		249 29.8	7.3	20 38.3		5.7	58.4	
D 12	357 01.4	S	6 41.3		263 56.1	7.1	N20 44.0		5.7	58.4	
O 13	12 01.5		40.4		278 22.2	7.1	20 49.7		5.6	58.5	
14	27 01.6		39.4		292 48.3	7.1	20 55.3		5.4	58.5	
15	42 01.8	. .	38.4		307 14.4	6.9	21 00.7		5.3	58.5	
16	57 01.9		37.5		321 40.3	6.8	21 06.0		5.2	58.6	
17	72 02.0		36.5		336 06.1	6.8	21 11.2		5.0	58.6	
18	87 02.2	S	6 35.6		350 31.9	6.7	N21 16.2		4.9	58.6	
19	102 02.3		34.6		4 57.6	6.6	21 21.1		4.8	58.7	
20	117 02.4		33.6		19 23.2	6.5	21 25.9		4.7	58.7	
21	132 02.6	. .	32.7		33 48.7	6.4	21 30.6		4.5	58.7	
22	147 02.7		31.7		48 14.1	6.4	21 35.1		4.4	58.8	
23	162 02.8		30.7		62 39.5	6.3	21 39.5		4.3	58.8	
4 00	177 03.0	S	6 29.8		77 04.8	6.2	N21 43.8		4.1	58.8	
01	192 03.1		28.8		91 30.0	6.1	21 47.9		4.0	58.9	
02	207 03.2		27.9		105 55.1	6.0	21 51.9		3.9	58.9	
03	222 03.4	. .	26.9		120 20.1	6.0	21 55.8		3.7	58.9	
04	237 03.5		25.9		134 45.1	5.9	21 59.5		3.6	58.9	
05	252 03.6		25.0		149 10.0	5.9	22 03.1		3.5	59.0	
06	267 03.8	S	6 24.0		163 34.9	5.7	N22 06.6		3.3	59.0	
07	282 03.9		23.0		177 59.6	5.7	22 09.9		3.1	59.0	
08	297 04.1		22.1		192 24.3	5.6	22 13.0		3.1	59.1	
D 09	312 04.2	. .	21.1		206 48.9	5.6	22 16.1		2.9	59.1	
O 10	327 04.3		20.2		221 13.5	5.5	22 19.0		2.7	59.1	
M 11	342 04.5		19.2		235 38.0	5.4	22 21.7		2.6	59.2	
I 12	357 04.6	S	6 18.2		250 02.4	5.3	N22 24.3		2.4	59.2	
N 13	12 04.7		17.3		264 26.7	5.3	22 26.7		2.3	59.2	
G 14	27 04.9		16.3		278 51.0	5.2	22 29.0		2.2	59.3	
O 15	42 05.0	. .	15.3		293 15.2	5.2	22 31.2		2.0	59.3	
16	57 05.2		14.4		307 39.4	5.1	22 33.2		1.8	59.3	
17	72 05.3		13.4		322 03.5	5.1	22 35.0		1.7	59.3	
18	87 05.4	S	6 12.4		336 27.6	5.0	N22 36.7		1.6	59.4	
19	102 05.6		11.5		350 51.6	4.9	22 38.3		1.4	59.4	
20	117 05.7		10.5		5 15.5	4.9	22 39.7		1.3	59.4	
21	132 05.9	. .	09.6		19 39.4	4.8	22 41.0		1.0	59.5	
22	147 06.0		08.6		34 03.2	4.8	22 42.0		1.0	59.5	
23	162 06.1		07.6		48 27.0	4.8	N22 43.0		0.8	59.5	
	SD 16.2	d	1.0		SD	15.7		15.9			16.1

Lat.	Crepúsculo Náutico	Crepúsculo Civil	Orto Sol	Orto Luna 2	Orto Luna 3	Orto Luna 4	Orto Luna 5
°	h m	h m	h m	h m	h m	h m	h m
N 72	05 00	06 18	07 26	06 39	▭	▭	▭
N 70	05 06	06 16	07 18	07 31	▭	▭	▭
68	05 11	06 15	07 11	08 03	07 53	▭	▭
66	05 15	06 14	07 05	08 27	08 33	C8 49	09 36
64	05 18	06 13	07 00	08 46	09 00	09 28	10 20
62	05 21	06 12	06 56	09 02	09 22	09 55	10 50
60	05 23	06 11	06 53	09 15	09 39	10 16	11 12
N 58	05 25	06 10	06 49	09 26	09 54	10 34	11 30
56	05 26	06 09	06 46	09 36	10 06	10 48	11 46
54	05 28	06 08	06 44	09 45	10 17	11 01	11 59
52	05 29	06 08	06 41	09 52	10 27	11 12	12 10
50	05 30	06 07	06 39	10 00	10 36	11 22	12 20
45	05 31	06 05	06 34	10 15	10 54	11 43	12 42
N 40	05 32	06 03	06 30	10 27	11 09	12 00	12 59
35	05 32	06 02	06 27	10 38	11 22	12 14	13 14
30	05 32	06 00	06 24	10 47	11 34	12 27	13 26
20	05 31	05 56	06 18	11 04	11 53	12 48	13 48
N 10	05 28	05 52	06 13	11 18	12 10	13 06	14 07
0	05 24	05 48	06 09	11 31	12 26	13 24	14 24
S 10	05 18	05 43	06 04	11 45	12 42	13 41	14 42
20	05 10	05 36	05 58	12 00	12 59	14 00	15 01
30	05 00	05 28	05 52	12 16	13 19	14 22	15 23
35	04 53	05 23	05 49	12 26	13 30	14 34	15 35
40	04 44	05 17	05 45	12 37	13 44	14 49	15 50
45	04 34	05 10	05 40	12 51	14 00	15 06	16 07
S 50	04 20	05 01	05 34	13 07	14 19	15 28	16 29
52	04 14	04 56	05 31	13 14	14 28	15 38	16 39
54	04 06	04 52	05 28	13 23	14 39	15 50	16 51
56	03 58	04 46	05 25	13 32	14 51	16 03	17 04
58	03 48	04 40	05 22	13 43	15 04	16 18	17 19
S 60	03 37	04 33	05 17	13 56	15 21	16 37	17 37

Lat.	Ocaso Sol	Crepúsculo Civil	Crepúsculo Náutico	Ocaso Luna 2	Ocaso Luna 3	Ocaso Luna 4	Ocaso Luna 5
°	h m	h m	h m	h m	h m	h m	h m
N 72	17 00	18 08	19 27	03 40	▭	▭	▭
N 70	17 08	18 10	19 21	02 50	▭	▭	▭
68	17 15	18 11	19 15	02 18	04 19	▭	▭
66	17 20	18 12	19 11	01 55	03 40	05 23	06 41
64	17 25	18 13	19 08	01 37	03 13	04 45	05 57
62	17 29	18 13	19 05	01 23	02 53	04 18	05 28
60	17 32	18 14	19 02	01 10	02 36	03 57	05 05
N 58	17 36	18 15	19 00	01 00	02 22	03 40	04 47
56	17 38	18 16	18 59	00 50	02 09	03 25	04 32
54	17 41	18 16	18 57	00 42	01 59	03 13	04 19
52	17 43	18 17	18 56	00 35	01 49	03 02	04 07
50	17 45	18 18	18 55	00 28	01 41	02 52	03 57
45	17 50	18 19	18 53	00 14	01 23	02 31	03 35
N 40	17 54	18 21	18 53	00 03	01 09	02 15	03 18
35	17 57	18 23	18 52	24 57	00 57	02 01	03 03
30	18 00	18 24	18 52	24 46	00 46	01 49	02 51
20	18 06	18 28	18 54	24 28	00 28	01 28	02 29
N 10	18 11	18 32	18 56	24 12	00 12	01 10	02 10
0	18 15	18 36	19 00	23 57	24 53	00 53	01 52
S 10	18 20	18 41	19 06	23 42	24 36	00 36	01 35
20	18 25	18 47	19 13	23 26	24 18	00 18	01 16
30	18 31	18 55	19 24	23 08	23 58	24 54	00 54
35	18 35	19 00	19 30	22 58	23 46	24 41	00 41
40	18 38	19 06	19 39	22 46	23 32	24 26	00 26
45	18 43	19 13	19 49	22 32	23 15	24 09	00 09
S 50	18 49	19 22	20 02	22 15	22 55	23 47	24 52
52	18 51	19 26	20 08	22 06	22 46	23 37	24 42
54	18 54	19 31	20 16	21 58	22 35	23 25	24 30
56	18 57	19 36	20 24	21 47	22 23	23 12	24 17
58	19 01	19 42	20 33	21 36	22 09	22 56	24 02
S 60	19 05	19 49	20 44	21 23	21 52	22 37	23 44

Día	SOL E.T. (−) 00h	SOL E.T. (−) 12h	SOL Pas. Mer.	LUNA Pas. Mer. Sup.	LUNA Pas. Mer. Inf.	LUNA Edad	LUNA Fase
d	m s	m s	h m	h m	h m	d %	
2	12 13	12 07	12 12	17 44	05 18	07 44	◐
3	12 01	11 55	12 12	18 39	06 11	08 55	
4	11 48	11 42	12 12	19 38	07 08	09 66	

T.U.	ARIES	VENUS −4.6		MARTE +0.4		JUPITER −2.2		SATURNO +0.2	
d h	A.H.G.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.
	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
5 00	162 48.4	149 17.1	N12 46.0	275 14.3	S21 00.9	101 06.7	N20 19.4	109 13.4	N17 16.1
01	177 50.8	164 19.3	46.5	290 15.5	01.1	116 08.8	19.5	124 15.6	16.2
02	192 53.3	179 21.6	47.0	305 16.7	01.3	131 11.0	19.6	139 17.9	16.2
03	207 55.8	194 23.8	47.5	320 17.9	01.5	146 13.1	19.6	154 20.2	16.3
04	222 58.2	209 26.1	48.0	335 19.1	01.7	161 15.3	19.7	169 22.5	16.3
05	238 00.7	224 28.4	48.6	350 20.3	02.0	176 17.4	19.8	184 24.8	16.4
06	253 03.2	239 30.6	N12 49.1	5 21.5	S21 02.2	191 19.6	N20 19.8	199 27.1	N17 16.4
07	268 05.6	254 32.9	49.6	20 22.7	02.4	206 21.7	19.9	214 29.4	16.5
08	283 08.1	269 35.2	50.1	35 23.9	02.6	221 23.9	20.0	229 31.7	16.5
L 09	298 10.6	284 37.5	50.6	50 25.1	02.8	236 26.0	20.0	244 34.0	16.6
U 10	313 13.0	299 39.7	51.1	65 26.3	03.0	251 28.2	20.1	259 36.3	16.6
N 11	328 15.5	314 42.0	51.6	80 27.6	03.2	266 30.3	20.1	274 38.6	16.7
E 12	343 18.0	329 44.3	N12 52.1	95 28.8	S21 03.4	281 32.5	N20 20.2	289 40.9	N17 16.7
S 13	358 20.4	344 46.6	52.6	110 30.0	03.7	296 34.6	20.3	304 43.1	16.8
14	13 22.9	359 48.9	53.1	125 31.2	03.9	311 36.8	20.3	319 45.4	16.8
15	28 25.3	14 51.2	53.6	140 32.4	04.1	326 39.0	20.4	334 47.7	16.9
16	43 27.8	29 53.5	54.1	155 33.6	04.3	341 41.1	20.5	349 50.0	16.9
17	58 30.3	44 55.8	54.6	170 34.8	04.5	356 43.3	20.5	4 52.3	17.0
18	73 32.7	59 58.1	N12 55.1	185 36.0	S21 04.7	11 45.4	N20 20.6	19 54.6	N17 17.0
19	88 35.2	75 00.5	55.6	200 37.2	04.9	26 47.6	20.7	34 56.9	17.1
20	103 37.7	90 02.8	56.1	215 38.4	05.1	41 49.7	20.7	49 59.2	17.1
21	118 40.1	105 05.1	56.5	230 39.6	05.4	56 51.9	20.8	65 01.5	17.2
22	133 42.6	120 07.4	57.0	245 40.9	05.6	71 54.0	20.9	80 03.7	17.2
23	148 45.1	135 09.8	57.5	260 42.1	05.8	86 56.2	20.9	95 06.0	17.3
6 00	163 47.5	150 12.1	N12 58.0	275 43.3	S21 06.0	101 58.3	N20 21.0	110 08.3	N17 17.3
01	178 50.0	165 14.4	58.5	290 44.5	06.2	117 00.4	21.1	125 10.6	17.4
02	193 52.5	180 16.8	58.9	305 45.7	06.4	132 02.6	21.1	140 12.9	17.4
03	208 54.9	195 19.1	59.4	320 46.9	06.6	147 04.7	21.2	155 15.2	17.5
04	223 57.4	210 21.5	12 59.9	335 48.1	06.8	162 06.9	21.3	170 17.5	17.5
05	238 59.8	225 23.8	13 00.4	350 49.3	07.0	177 09.0	21.3	185 19.8	17.6
06	254 02.3	240 26.2	N13 00.8	5 50.5	S21 07.2	192 11.2	N20 21.4	200 22.1	N17 17.6
07	269 04.8	255 28.5	01.3	20 51.8	07.5	207 13.3	21.4	215 24.3	17.7
M 08	284 07.2	270 30.9	01.8	35 53.0	07.7	222 15.5	21.5	230 26.6	17.7
A 09	299 09.7	285 33.3	02.2	50 54.2	07.9	237 17.6	21.6	245 28.9	17.8
R 10	314 12.2	300 35.6	02.7	65 55.4	08.1	252 19.8	21.6	260 31.2	17.8
T 11	329 14.6	315 38.0	03.2	80 56.6	08.3	267 21.9	21.7	275 33.5	17.9
E 12	344 17.1	330 40.4	N13 03.6	95 57.8	S21 08.5	282 24.1	N20 21.8	290 35.8	N17 17.9
S 13	359 19.6	345 42.8	04.1	110 59.0	08.7	297 26.2	21.8	305 38.1	18.0
14	14 22.0	0 45.2	04.5	126 00.3	08.9	312 28.4	21.9	320 40.4	18.1
15	29 24.5	15 47.6	05.0	141 01.5	09.1	327 30.5	22.0	335 42.6	18.1
16	44 27.0	30 49.9	05.4	156 02.7	09.3	342 32.6	22.0	350 44.9	18.2
17	59 29.4	45 52.3	05.9	171 03.9	09.5	357 34.8	22.1	5 47.2	18.2
18	74 31.9	60 54.7	N13 06.3	186 05.1	S21 09.8	12 36.9	N20 22.2	20 49.5	N17 18.3
19	89 34.3	75 57.1	06.8	201 06.3	10.0	27 39.1	22.2	35 51.8	18.3
20	104 36.8	90 59.6	07.2	216 07.5	10.2	42 41.2	22.3	50 54.1	18.4
21	119 39.3	106 02.0	07.6	231 08.8	10.4	57 43.4	22.4	65 56.4	18.4
22	134 41.7	121 04.4	08.1	246 10.0	10.6	72 45.5	22.4	80 58.6	18.5
23	149 44.2	136 06.8	08.5	261 11.2	10.8	87 47.6	22.5	96 00.9	18.5
7 00	164 46.7	151 09.2	N13 09.0	276 12.4	S21 11.0	102 49.8	N20 22.6	111 03.2	N17 18.6
01	179 49.1	166 11.7	09.4	291 13.6	11.2	117 51.9	22.6	126 05.5	18.6
02	194 51.6	181 14.1	09.8	306 14.9	11.4	132 54.1	22.7	141 07.8	18.7
03	209 54.1	196 16.5	10.2	321 16.1	11.6	147 56.2	22.8	156 10.1	18.7
04	224 56.5	211 19.0	10.7	336 17.3	11.8	162 58.4	22.8	171 12.3	18.8
05	239 59.0	226 21.4	11.1	351 18.5	12.0	178 00.5	22.9	186 14.6	18.8
06	255 01.4	241 23.8	N13 11.5	6 19.7	S21 12.2	193 02.6	N20 23.0	201 16.9	N17 18.9
07	270 03.9	256 26.3	11.9	21 20.9	12.4	208 04.8	23.0	216 19.2	18.9
M 08	285 06.4	271 28.7	12.4	36 22.2	12.6	223 06.9	23.1	231 21.5	19.0
I 09	300 08.8	286 31.2	12.8	51 23.4	12.8	238 09.1	23.2	246 23.8	19.0
E 10	315 11.3	301 33.7	13.2	66 24.6	13.1	253 11.2	23.2	261 26.1	19.1
R 11	330 13.8	316 36.1	13.6	81 25.8	13.3	268 13.3	23.3	276 28.3	19.1
C 12	345 16.2	331 38.6	N13 14.0	96 27.1	S21 13.5	283 15.5	N20 23.4	291 30.6	N17 19.2
O 13	0 18.7	346 41.1	14.4	111 28.3	13.7	298 17.6	23.4	306 32.9	19.3
L 14	15 21.2	1 43.5	14.8	126 29.5	13.9	313 19.7	23.5	321 35.2	19.3
E 15	30 23.6	16 46.0	15.2	141 30.7	14.1	328 21.9	23.6	336 37.5	19.4
S 16	45 26.1	31 48.5	15.7	156 31.9	14.3	343 24.0	23.6	351 39.7	19.4
17	60 28.6	46 51.0	16.1	171 33.2	14.5	358 26.2	23.7	6 42.0	19.5
18	75 31.0	61 53.5	N13 16.5	186 34.4	S21 14.7	13 28.3	N20 23.8	21 44.3	N17 19.5
19	90 33.5	76 56.0	16.9	201 35.6	14.9	28 30.4	23.8	36 46.6	19.6
20	105 35.9	91 58.5	17.2	216 36.8	15.1	43 32.6	23.9	51 48.9	19.6
21	120 38.4	107 01.0	17.6	231 38.1	15.3	58 34.7	24.0	66 51.2	19.7
22	135 40.9	122 03.5	18.0	246 39.3	15.5	73 36.8	24.0	81 53.4	19.7
23	150 43.3	137 06.0	18.4	261 40.5	15.7	88 39.0	24.1	96 55.7	19.8
	h m								
Pas. Mer.	13 02.7	v 2.4	d 0.5	v 1.2	d 0.2	v 2.1	d 0.1	v 2.3	d 0.1

ESTRELLAS		
Nombre	A.H.S.	Dec.
	° ′	° ′
Acamar	315 25.8	S40 18.4
Achernar	335 34.3	S57 14.2
Acrux	173 19.6	S63 06.2
Adhara	255 19.9	S28 58.7
Aldebaran	291 00.5	N16 30.6
Alioth	166 28.5	N55 57.1
Alkaid	153 06.1	N49 18.3
Al Na'ir	27 56.2	S46 57.4
Alnilam	275 56.1	S 1 12.2
Alphard	218 05.3	S 8 39.9
Alphecca	126 19.0	N26 42.5
Alpheratz	357 53.8	N29 05.6
Altair	62 17.8	N 8 52.1
Ankaa	353 25.5	S42 18.3
Antares	112 38.1	S26 26.0
Arcturus	146 04.3	N19 10.5
Atria	107 48.6	S69 01.5
Avior	234 21.5	S59 31.0
Bellatrix	278 42.3	N 6 20.9
Betelgeuse	271 11.6	N 7 24.3
Canopus	264 00.2	S52 42.1
Capella	280 48.7	N46 00.0
Deneb	49 38.4	N45 16.8
Denebola	182 43.1	N14 33.9
Diphda	349 05.8	S17 59.1
Dubhe	194 02.7	N61 44.7
Elnath	278 24.8	N28 36.5
Eltanin	90 50.7	N51 29.0
Enif	33 56.9	N 9 52.6
Fomalhaut	15 34.9	S29 37.2
Gacrux	172 11.2	S57 07.0
Gienah	176 01.9	S17 32.9
Hadar	149 01.3	S60 22.5
Hamal	328 11.9	N23 27.9
Kaus Aust.	83 56.7	S34 23.0
Kochab	137 18.9	N74 08.8
Markab	13 48.3	N15 12.5
Menkar	314 25.3	N 4 05.5
Menkent	148 18.7	S36 22.4
Miaplacidus	221 41.0	S69 43.4
Mirfak	308 54.4	N49 52.0
Nunki	76 10.4	S26 17.7
Peacock	53 34.8	S56 43.8
Pollux	243 39.2	N28 01.4
Procyon	245 09.6	N 5 13.2
Rasalhague	96 15.4	N12 33.4
Regulus	207 53.4	N11 57.7
Rigel	281 21.3	S 8 12.2
Rigil Kent.	140 04.7	S60 50.1
Sabik	102 23.6	S15 43.6
Schedar	349 52.1	N56 32.6
Shaula	96 35.1	S37 06.2
Sirius	258 42.1	S16 43.3
Spica	158 41.2	S11 10.0
Suhail	222 59.2	S43 26.4
Vega	80 45.6	N38 46.8
Zuben'ubi	137 15.9	S16 02.8

	A.H.S.	Pas. Mer.
	° ′	h m
Venus	346 24.6	13 57
Marte	111 55.7	5 37
Júpiter	298 10.8	17 10
Saturno	306 20.8	16 37

T.U.	SOL				LUNA						
	A.H.G.		Dec.		A.H.G.	v		Dec.	d	P.H.	
d h	°	′	°	′	°	′	′	°	′	′	′
5 00	177	06.3	S 6	06.7	62	50.8	4.7	N22	43.8	0.6	59.6
01	192	06.4		05.7	77	14.5	4.6	22	44.4	0.5	59.6
02	207	06.6		04.7	91	38.1	4.6	22	44.9	0.3	59.6
03	222	06.7		03.8	106	01.7	4.6	22	45.2	0.2	59.6
04	237	06.8		02.8	120	25.3	4.5	22	45.4	0.0	59.7
05	252	07.0		01.8	134	48.8	4.5	22	45.4	0.2	59.7
06	267	07.1	S 6	00.9	149	12.3	4.4	N22	45.2	0.3	59.7
07	282	07.3	5	59.9	163	35.7	4.4	22	44.9	0.5	59.8
L 08	297	07.4		58.9	177	59.1	4.4	22	44.4	0.6	59.8
09	312	07.6		58.0	192	22.5	4.3	22	43.8	0.8	59.8
U 10	327	07.7		57.0	206	45.8	4.3	22	43.0	0.9	59.8
11	342	07.8		56.0	221	09.1	4.3	22	42.1	1.1	59.9
N 12	357	08.0	S 5	55.1	235	32.4	4.3	N22	41.0	1.3	59.9
E 13	12	08.1		54.1	249	55.7	4.2	22	39.7	1.4	59.9
14	27	08.3		53.1	264	18.9	4.2	22	38.3	1.6	59.9
S 15	42	08.4		52.2	278	42.1	4.2	22	36.7	1.8	60.0
16	57	08.6		51.2	293	05.3	4.2	22	34.9	1.9	60.0
17	72	08.7		50.2	307	28.5	4.1	22	33.0	2.0	60.0
18	87	08.8	S 5	49.3	321	51.6	4.1	N22	31.0	2.3	60.1
19	102	09.0		48.3	336	14.7	4.2	22	28.7	2.4	60.1
20	117	09.1		47.3	350	37.9	4.1	22	26.3	2.5	60.1
21	132	09.3		46.4	5	01.0	4.1	22	23.8	2.7	60.1
22	147	09.4		45.4	19	24.1	4.1	22	21.1	2.9	60.2
23	162	09.6		44.4	33	47.2	4.0	22	18.2	3.1	60.2
6 00	177	09.7	S 5	43.5	48	10.2	4.1	N22	15.1	3.2	60.2
01	192	09.9		42.5	62	33.3	4.1	22	11.9	3.3	60.2
02	207	10.0		41.5	76	56.4	4.1	22	08.6	3.5	60.3
03	222	10.1		40.5	91	19.5	4.0	22	05.1	3.7	60.3
04	237	10.3		39.6	105	42.5	4.1	22	01.4	3.9	60.3
05	252	10.4		38.6	120	05.6	4.1	21	57.5	4.0	60.3
06	267	10.6	S 5	37.6	134	28.7	4.1	N21	53.5	4.1	60.3
07	282	10.7		36.7	148	51.8	4.1	21	49.4	4.4	60.4
M 08	297	10.9		35.7	163	14.9	4.1	21	45.0	4.4	60.4
A 09	312	11.0		34.7	177	38.0	4.1	21	40.6	4.7	60.4
R 10	327	11.2		33.8	192	01.1	4.1	21	35.9	4.8	60.4
11	342	11.3		32.8	206	24.2	4.2	21	31.1	4.9	60.4
T 12	357	11.5	S 5	31.8	220	47.4	4.1	N21	26.2	5.2	60.5
13	12	11.6		30.9	235	10.5	4.2	21	21.0	5.2	60.5
E 14	27	11.8		29.9	249	33.7	4.2	21	15.8	5.4	60.5
S 15	42	11.9		28.9	263	56.9	4.2	21	10.4	5.6	60.5
16	57	12.1		27.9	278	20.1	4.2	21	04.8	5.8	60.5
17	72	12.2		27.0	292	43.3	4.3	20	59.0	5.8	60.6
18	87	12.4	S 5	26.0	307	06.6	4.3	N20	53.2	6.1	60.6
19	102	12.5		25.0	321	29.9	4.3	20	47.1	6.2	60.6
20	117	12.7		24.1	335	53.2	4.3	20	40.9	6.3	60.6
21	132	12.8		23.1	350	16.5	4.4	20	34.6	6.5	60.6
22	147	12.9		22.1	4	39.9	4.4	20	28.1	6.7	60.7
23	162	13.1		21.1	19	03.3	4.5	20	21.4	6.8	60.7
7 00	177	13.2	S 5	20.2	33	26.8	4.4	N20	14.6	6.9	60.7
01	192	13.4		19.2	47	50.2	4.6	20	07.7	7.1	60.7
02	207	13.5		18.2	62	13.8	4.5	20	00.6	7.2	60.7
03	222	13.7		17.3	76	37.3	4.6	19	53.4	7.4	60.7
04	237	13.8		16.3	91	00.9	4.6	19	46.0	7.5	60.7
05	252	14.0		15.3	105	24.5	4.7	19	38.5	7.7	60.8
M 06	267	14.1	S 5	14.3	119	48.2	4.7	N19	30.8	7.8	60.8
I 07	282	14.3		13.4	134	11.9	4.8	19	23.0	8.0	60.8
E 08	297	14.5		12.4	148	35.7	4.8	19	15.0	8.1	60.8
R 09	312	14.6		11.4	162	59.5	4.8	19	06.9	8.2	60.8
C 10	327	14.8		10.5	177	23.3	4.9	18	58.7	8.3	60.8
11	342	14.9		09.5	191	47.2	5.0	18	50.4	8.5	60.8
O 12	357	15.1	S 5	08.5	206	11.2	5.0	N18	41.9	8.7	60.8
L 13	12	15.2		07.5	220	35.2	5.0	18	33.2	8.8	60.8
E 14	27	15.4		06.6	234	59.2	5.1	18	24.4	8.9	60.9
S 15	42	15.5		05.6	249	23.3	5.2	18	15.5	9.0	60.9
16	57	15.7		04.6	263	47.5	5.2	18	06.5	9.2	60.9
17	72	15.8		03.6	278	11.7	5.2	17	57.3	9.2	60.9
18	87	16.0	S 5	02.7	292	35.9	5.3	N17	48.1	9.5	60.9
19	102	16.1		01.7	307	00.2	5.4	17	38.6	9.5	60.9
20	117	16.3	5	00.7	321	24.6	5.4	17	29.1	9.7	60.9
21	132	16.4	4	59.7	335	49.0	5.5	17	19.4	9.7	60.9
22	147	16.6		58.8	350	13.5	5.5	17	09.7	10.0	60.9
23	162	16.7		57.8	4	38.0	5.6	N16	59.7	10.0	60.9
	SD	16.1	d	1.0	SD	16.3		16.5		16.6	

Lat.	Crepúsculo Náutico	Crepúsculo Civil	Orto Sol	Orto Luna 5	Orto Luna 6	Orto Luna 7	Orto Luna 8
°	h m	h m	h m	h m	h m	h m	h m
N 72	04 44	06 03	07 10	▭	▭	▭	13 53
N 70	04 52	06 03	07 04	▭	▭	11 46	14 24
68	04 58	06 03	06 58	▭	10 08	12 34	14 46
66	05 03	06 03	06 54	09 36	11 09	13 05	15 04
64	05 08	06 03	06 50	10 20	11 44	13 28	15 18
62	05 11	06 02	06 47	10 50	12 09	13 46	15 30
60	05 14	06 02	06 44	11 12	12 29	14 01	15 40
N 58	05 17	06 02	06 41	11 30	12 45	14 14	15 48
56	05 19	06 02	06 39	11 46	12 59	14 25	15 56
54	05 21	06 01	06 37	11 59	13 11	14 34	16 03
52	05 22	06 01	06 35	12 10	13 22	14 43	16 09
50	05 23	06 01	06 33	12 20	13 31	14 51	16 14
45	05 26	06 00	06 29	12 42	13 51	15 07	16 26
N 40	05 28	05 59	06 26	12 59	14 07	15 20	16 36
35	05 28	05 58	06 23	13 14	14 20	15 31	16 44
30	05 29	05 57	06 20	13 26	14 32	15 41	16 51
20	05 28	05 54	06 16	13 48	14 52	15 58	17 04
N 10	05 26	05 51	06 12	14 07	15 10	16 13	17 15
0	05 23	05 47	06 08	14 24	15 26	16 27	17 25
S 10	05 18	05 43	06 04	14 42	15 42	16 40	17 35
20	05 11	05 37	06 00	15 01	16 00	16 55	17 46
30	05 02	05 30	05 54	15 23	16 20	17 12	17 58
35	04 56	05 26	05 51	15 35	16 31	17 21	18 05
40	04 48	05 20	05 48	15 50	16 45	17 32	18 13
45	04 38	05 14	05 44	16 07	17 00	17 45	18 23
S 50	04 26	05 06	05 39	16 29	17 20	18 01	18 34
52	04 20	05 02	05 37	16 39	17 29	18 08	18 39
54	04 13	04 58	05 34	16 51	17 39	18 16	18 45
56	04 06	04 53	05 32	17 04	17 51	18 25	18 51
58	03 57	04 48	05 29	17 19	18 04	18 36	18 58
S 60	03 47	04 42	05 25	17 37	18 19	18 47	19 06

Lat.	Ocaso Sol	Crepúsculo Civil	Crepúsculo Náutico	Ocaso Luna 5	Ocaso Luna 6	Ocaso Luna 7	Ocaso Luna 8
°	h m	h m	h m	h m	h m	h m	h m
N 72	17 14	18 22	19 42	▭	▭	▭	08 49
N 70	17 21	18 22	19 33	▭	▭	08 51	08 16
68	17 26	18 22	19 27	▭	08 20	08 01	07 52
66	17 30	18 21	19 21	06 41	07 17	07 29	07 33
64	17 34	18 21	19 17	05 57	06 42	07 06	07 18
62	17 37	18 21	19 13	05 28	06 17	06 47	07 05
60	17 40	18 22	19 10	05 05	05 56	06 31	06 54
N 58	17 43	18 22	19 07	04 47	05 40	06 18	06 45
56	17 45	18 22	19 05	04 32	05 26	06 06	06 36
54	17 47	18 22	19 03	04 19	05 13	05 56	06 29
52	17 49	18 22	19 02	04 07	05 03	05 47	06 22
50	17 50	18 23	19 00	03 57	04 53	05 39	06 16
45	17 54	18 23	18 57	03 35	04 33	05 22	06 03
N 40	17 57	18 24	18 56	03 18	04 16	05 07	05 52
35	18 00	18 25	18 55	03 03	04 02	04 55	05 42
30	18 02	18 26	18 54	02 51	03 50	04 45	05 34
20	18 07	18 29	18 54	02 29	03 29	04 26	05 19
N 10	18 11	18 32	18 56	02 10	03 11	04 10	05 07
0	18 15	18 35	18 59	01 52	02 54	03 55	04 55
S 10	18 18	18 40	19 04	01 35	02 37	03 40	04 43
20	18 23	18 45	19 11	01 16	02 18	03 24	04 30
30	18 28	18 52	19 20	00 54	01 57	03 05	04 15
35	18 31	18 56	19 26	00 41	01 44	02 54	04 06
40	18 34	19 01	19 34	00 26	01 30	02 41	03 56
45	18 38	19 07	19 43	00 09	01 13	02 26	03 44
S 50	18 42	19 15	19 55	24 52	00 52	02 07	03 30
52	18 45	19 19	20 01	24 42	00 42	01 59	03 23
54	18 47	19 23	20 07	24 30	00 30	01 49	03 15
56	18 50	19 28	20 15	24 17	00 17	01 38	03 07
58	18 53	19 33	20 23	24 02	00 02	01 25	02 57
S 60	18 56	19 39	20 33	23 44	25 10	01 10	02 47

Día	SOL E. T. (−) 00h	SOL E. T. (−) 12h	SOL Pas. Mer.	LUNA Pas. Sup.	LUNA Mer. Inf.	LUNA Edad	LUNA Fase
d	m s	m s	h m	h m	h m	d	%
5	11 35	11 28	12 11	20 39	08 08	10	76
6	11 21	11 14	12 11	21 41	09 10	11	85
7	11 07	11 00	12 11	22 41	10 11	12	93

T.U.	ARIES	VENUS −4.5		MARTE +0.3		JUPITER −2.2		SATURNO +0.2		ESTRELLAS		
	A.H.G.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.	Nombre	A.H.S.	Dec.
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′		° ′	° ′
8 00	165 45.8	152 08.5	N13 18.8	276 41.7	S21 15.9	103 41.1	N20 24.2	111 58.0	N17 19.8	Acamar	315 25.8	S40 18.4
01	180 48.3	167 11.0	19.2	291 43.0	16.1	118 43.3	24.2	127 00.3	19.9	Achernar	335 34.3	S57 14.2
02	195 50.7	182 13.5	19.6	306 44.2	16.3	133 45.4	24.3	142 02.6	19.9	Acrux	173 19.6	S63 06.2
03	210 53.2	197 16.1 . .	20.0	321 45.4 . .	16.5	148 47.5 . .	24.4	157 04.8 . .	20.0	Adhara	255 19.9	S28 58.7
04	225 55.7	212 18.6	20.3	336 46.6	16.7	163 49.7	24.4	172 07.1	20.0	Aldebaran	291 00.5	N16 30.6
05	240 58.1	227 21.1	20.7	351 47.9	16.9	178 51.8	24.5	187 09.4	20.1			
06	256 00.6	242 23.7	N13 21.1	6 49.1	S21 17.1	193 53.9	N20 24.6	202 11.7	N17 20.1	Alioth	166 28.5	N55 57.1
07	271 03.1	257 26.2	21.5	21 50.3	17.3	208 56.1	24.6	217 14.0	20.2	Alkaid	153 06.0	N49 18.3
J 08	286 05.5	272 28.7	21.8	36 51.5	17.5	223 58.2	24.7	232 16.2	20.3	Al Na'ir	27 56.2	S46 57.4
U 09	301 08.0	287 31.3 . .	22.2	51 52.8 . .	17.7	239 00.3 . .	24.8	247 18.5 . .	20.3	Alnilam	275 56.1	S 1 12.2
10	316 10.4	302 33.8	22.6	66 54.0	17.9	254 02.5	24.8	262 20.8	20.4	Alphard	218 05.3	S 8 39.9
E 11	331 12.9	317 36.4	22.9	81 55.2	18.1	269 04.6	24.9	277 23.1	20.4			
V 12	346 15.4	332 39.0	N13 23.3	96 56.4	S21 18.3	284 06.7	N20 25.0	292 25.4	N17 20.5	Alphecca	126 19.0	N26 42.5
13	1 17.8	347 41.5	23.7	111 57.7	18.5	299 08.9	25.0	307 27.6	20.5	Alpheratz	357 53.8	N29 05.6
E 14	16 20.3	2 44.1	24.0	126 58.9	18.7	314 11.0	25.1	322 29.9	20.6	Altair	62 17.8	N 8 52.1
15	31 22.8	17 46.6 . .	24.4	142 00.1 . .	18.9	329 13.1 . .	25.2	337 32.2 . .	20.6	Ankaa	353 25.5	S42 18.3
S 16	46 25.2	32 49.2	24.7	157 01.4	19.1	344 15.2	25.2	352 34.5	20.7	Antares	112 38.0	S26 26.0
17	61 27.7	47 51.8	25.1	172 02.6	19.3	359 17.4	25.3	7 36.8	20.7			
18	76 30.2	62 54.4	N13 25.5	187 03.8	S21 19.5	14 19.5	N20 25.4	22 39.0	N17 20.8	Arcturus	146 04.3	N19 10.5
19	91 32.6	77 57.0	25.8	202 05.1	19.7	29 21.6	25.4	37 41.3	20.8	Atria	107 48.6	S69 01.5
20	106 35.1	92 59.6	26.1	217 06.3	19.9	44 23.8	25.5	52 43.6	20.9	Avior	234 21.5	S59 31.0
21	121 37.5	108 02.1 . .	26.5	232 07.5 . .	20.1	59 25.9 . .	25.6	67 45.9 . .	20.9	Bellatrix	278 42.3	N 6 20.9
22	136 40.0	123 04.7	26.8	247 08.7	20.3	74 28.0	25.7	82 48.1	21.0	Betelgeuse	271 11.7	N 7 24.3
23	151 42.5	138 07.3	27.2	262 10.0	20.5	89 30.2	25.7	97 50.4	21.1			
9 00	166 44.9	153 09.9	N13 27.5	277 11.2	S21 20.7	104 32.3	N20 25.8	112 52.7	N17 21.1	Canopus	264 00.3	S52 42.1
01	181 47.4	168 12.6	27.9	292 12.4	20.9	119 34.4	25.9	127 55.0	21.2	Capella	280 48.7	N46 00.0
02	196 49.9	183 15.2	28.2	307 13.7	21.1	134 36.5	25.9	142 57.3	21.2	Deneb	49 38.4	N45 16.8
03	211 52.3	198 17.8 . .	28.5	322 14.9 . .	21.3	149 38.7 . .	26.0	157 59.5 . .	21.3	Denebola	182 43.1	N14 33.9
04	226 54.8	213 20.4	28.9	337 16.1	21.5	164 40.8	26.1	173 01.8	21.3	Diphda	349 05.8	S17 59.1
05	241 57.3	228 23.0	29.2	352 17.4	21.7	179 42.9	26.1	188 04.1	21.4			
06	256 59.7	243 25.7	N13 29.5	7 18.6	S21 21.9	194 45.1	N20 26.2	203 06.4	N17 21.4	Dubhe	194 02.7	N61 44.7
07	272 02.2	258 28.3	29.8	22 19.8	22.1	209 47.2	26.3	218 08.6	21.5	Elnath	278 24.8	N28 36.5
08	287 04.7	273 30.9	30.2	37 21.1	22.3	224 49.3	26.3	233 10.9	21.5	Eltanin	90 50.7	N51 29.0
V 09	302 07.1	288 33.6 . .	30.5	52 22.3 . .	22.5	239 51.4 . .	26.4	248 13.2 . .	21.6	Enif	33 56.9	N 9 52.6
I 10	317 09.6	303 36.2	30.8	67 23.5	22.7	254 53.6	26.5	263 15.5	21.6	Fomalhaut	15 34.9	S29 37.2
E 11	332 12.0	318 38.8	31.1	82 24.8	22.9	269 55.7	26.5	278 17.7	21.7			
R 12	347 14.5	333 41.5	N13 31.4	97 26.0	S21 23.1	284 57.8	N20 26.6	293 20.0	N17 21.7	Gacrux	172 11.2	S57 07.1
N 13	2 17.0	348 44.2	31.7	112 27.3	23.3	299 59.9	26.7	308 22.3	21.8	Gienah	176 01.9	S17 32.9
E 14	17 19.4	3 46.8	32.0	127 28.5	23.5	315 02.1	26.7	323 24.6	21.9	Hadar	149 01.2	S60 22.5
S 15	32 21.9	18 49.5 . .	32.3	142 29.7 . .	23.7	330 04.2 . .	26.8	338 26.8 . .	21.9	Hamal	328 11.9	N23 27.9
16	47 24.4	33 52.1	32.7	157 31.0	23.9	345 06.3	26.9	353 29.1	22.0	Kaus Aust.	83 56.7	S34 23.0
17	62 26.8	48 54.8	33.0	172 32.2	24.1	0 08.4	26.9	8 31.4	22.0			
18	77 29.3	63 57.5	N13 33.3	187 33.4	S21 24.3	15 10.6	N20 27.0	23 33.7	N17 22.1	Kochab	137 18.8	N74 08.8
19	92 31.8	79 00.2	33.6	202 34.7	24.5	30 12.7	27.1	38 35.9	22.1	Markab	13 48.3	N15 12.5
20	107 34.2	94 02.8	33.9	217 35.9	24.6	45 14.8	27.1	53 38.2	22.2	Menkar	314 25.3	N 4 05.5
21	122 36.7	109 05.5 . .	34.1	232 37.2 . .	24.8	60 16.9 . .	27.2	68 40.5 . .	22.2	Menkent	148 18.7	S36 22.4
22	137 39.2	124 08.2	34.4	247 38.4	25.0	75 19.1	27.3	83 42.8	22.3	Miaplacidus	221 41.0	S69 43.4
23	152 41.6	139 10.9	34.7	262 39.6	25.2	90 21.2	27.4	98 45.0	22.3			
10 00	167 44.1	154 13.6	N13 35.0	277 40.9	S21 25.4	105 23.3	N20 27.4	113 47.3	N17 22.4	Mirfak	308 54.4	N49 52.0
01	182 46.5	169 16.3	35.3	292 42.1	25.6	120 25.4	27.5	128 49.6	22.5	Nunki	76 10.4	S26 17.7
02	197 49.0	184 19.0	35.6	307 43.3	25.8	135 27.6	27.6	143 51.9	22.5	Peacock	53 34.7	S56 43.8
03	212 51.5	199 21.7 . .	35.9	322 44.6 . .	26.0	150 29.7 . .	27.6	158 54.1 . .	22.6	Pollux	243 39.3	N28 01.4
04	227 53.9	214 24.4	36.1	337 45.8	26.2	165 31.8	27.7	173 56.4	22.6	Procyon	245 09.6	N 5 13.2
05	242 56.4	229 27.1	36.4	352 47.1	26.4	180 33.9	27.8	188 58.7	22.7			
06	257 58.9	244 29.9	N13 36.7	7 48.3	S21 26.6	195 36.0	N20 27.8	204 01.0	N17 22.7	Rasalhague	96 15.4	N12 33.4
07	273 01.3	259 32.6	37.0	22 49.6	26.8	210 38.2	27.9	219 03.2	22.8	Regulus	207 53.4	N11 57.7
S 08	288 03.8	274 35.3	37.2	37 50.8	27.0	225 40.3	28.0	234 05.5	22.8	Rigel	281 21.3	S 8 12.2
A 09	303 06.3	289 38.0 . .	37.5	52 52.0 . .	27.2	240 42.4 . .	28.0	249 07.8 . .	22.9	Rigil Kent.	140 04.7	S60 50.1
B 10	318 08.7	304 40.8	37.8	67 53.3	27.4	255 44.5	28.1	264 10.0	22.9	Sabik	102 23.6	S15 43.6
A 11	333 11.2	319 43.5	38.0	82 54.5	27.6	270 46.6	28.2	279 12.3	23.0			
D 12	348 13.6	334 46.2	N13 38.3	97 55.8	S21 27.7	285 48.8	N20 28.2	294 14.6	N17 23.0	Schedar	349 52.1	N56 32.6
13	3 16.1	349 49.0	38.6	112 57.0	27.9	300 50.9	28.3	309 16.9	23.1	Shaula	96 35.0	S37 06.2
O 14	18 18.6	4 51.7	38.8	127 58.3	28.1	315 53.0	28.4	324 19.1	23.2	Sirius	258 42.1	S16 43.3
15	33 21.0	19 54.5 . .	39.1	142 59.5 . .	28.3	330 55.1 . .	28.5	339 21.4 . .	23.2	Spica	158 41.1	S11 10.0
16	48 23.5	34 57.3	39.3	158 00.7	28.5	345 57.2	28.5	354 23.7	23.3	Suhail	222 59.2	S43 26.4
17	63 26.0	50 00.0	39.6	173 02.0	28.7	0 59.4	28.6	9 26.0	23.3			
18	78 28.4	65 02.8	N13 39.8	188 03.2	S21 28.9	16 01.5	N20 28.7	24 28.2	N17 23.4	Vega	80 45.6	N38 46.8
19	93 30.9	80 05.6	40.1	203 04.5	29.1	31 03.6	28.7	39 30.5	23.4	Zuben'ubi	137 15.9	S16 02.8
20	108 33.4	95 08.3	40.3	218 05.7	29.3	46 05.7	28.8	54 32.8	23.5		A.H.S.	Pas. Mer.
21	123 35.8	110 11.1 . .	40.6	233 07.0 . .	29.5	61 07.8 . .	28.9	69 35.0 . .	23.5		° ′	h m
22	138 38.3	125 13.9	40.8	248 08.2	29.7	76 09.9	28.9	84 37.3	23.6	Venus	346 25.0	13 45
23	153 40.8	140 16.7	41.0	263 09.5	29.9	91 12.1	29.0	99 39.6	23.6	Marte	110 26.3	5 31
	h m									Júpiter	297 47.3	16 59
Pas. Mer.	12 50.9	v 2.7	d 0.3	v 1.2	d 0.2	v 2.1	d 0.1	v 2.3	d 0.1	Saturno	306 07.8	16 26

T.U.	SOL				LUNA					
	A.H.G.		Dec.		A.H.G.	v	Dec.	d	P.H.	
d h	° ′		° ′		° ′	′	° ′	′	′	
8 00	177 16.9	S	4 56.8		19 02.6	5.7	N16 49.7	10.1	60.9	
01	192 17.0		55.8		33 27.3	5.7	16 39.6	10.3	60.9	
02	207 17.2		54.9		47 52.0	5.8	16 29.3	10.4	60.9	
03	222 17.3	. .	53.9		62 16.8	5.8	16 18.9	10.5	60.9	
04	237 17.5		52.9		76 41.6	5.9	16 08.4	10.6	60.9	
05	252 17.7		51.9		91 06.5	6.0	15 57.8	10.7	60.9	
06	267 17.8	S	4 51.0		105 31.5	6.0	N15 47.1	10.8	60.9	
07	282 18.0		50.0		119 56.5	6.1	15 36.3	10.9	60.9	
J 08	297 18.1		49.0		134 21.6	6.2	15 25.4	11.0	60.9	
U 09	312 18.3	. .	48.0		148 46.8	6.2	15 14.4	11.2	60.9	
E 10	327 18.4		47.1		163 12.0	6.3	15 03.2	11.2	60.9	
V 11	342 18.6		46.1		177 37.3	6.4	14 52.0	11.4	60.9	
12	357 18.7	S	4 45.1		192 02.7	6.4	N14 40.6	11.4	60.9	
E 13	12 18.9		44.1		206 28.1	6.4	14 29.2	11.5	60.9	
14	27 19.1		43.2		220 53.5	6.6	14 17.7	11.6	60.9	
S 15	42 19.2	. .	42.2		235 19.1	6.6	14 06.1	11.8	60.9	
16	57 19.4		41.2		249 44.7	6.7	13 54.3	11.8	60.9	
17	72 19.5		40.2		264 10.4	6.7	13 42.5	11.9	60.9	
18	87 19.7	S	4 39.3		278 36.1	6.8	N13 30.6	12.0	60.9	
19	102 19.8		38.3		293 01.9	6.9	13 18.6	12.0	60.9	
20	117 20.0		37.3		307 27.8	6.9	13 06.6	12.2	60.9	
21	132 20.2	. .	36.3		321 53.7	7.0	12 54.4	12.2	60.9	
22	147 20.3		35.4		336 19.7	7.1	12 42.2	12.4	60.9	
23	162 20.5		34.4		350 45.8	7.2	12 29.8	12.4	60.9	
9 00	177 20.6	S	4 33.4		5 12.0	7.2	N12 17.4	12.4	60.9	
01	192 20.8		32.4		19 38.2	7.2	12 05.0	12.6	60.9	
02	207 20.9		31.5		34 04.4	7.4	11 52.4	12.6	60.9	
03	222 21.1	. .	30.5		48 30.8	7.4	11 39.8	12.7	60.9	
04	237 21.3		29.5		62 57.2	7.4	11 27.1	12.8	60.9	
05	252 21.4		28.5		77 23.6	7.6	11 14.3	12.8	60.8	
06	267 21.6	S	4 27.5		91 50.2	7.6	N11 01.5	12.9	60.8	
07	282 21.7		26.6		106 16.8	7.6	10 48.6	13.0	60.8	
V 08	297 21.9		25.6		120 43.4	7.7	10 35.6	13.0	60.8	
I 09	312 22.0	. .	24.6		135 10.1	7.8	10 22.6	13.1	60.8	
E 10	327 22.2		23.6		149 36.9	7.9	10 09.5	13.2	60.8	
R 11	342 22.4		22.7		164 03.8	7.9	9 56.3	13.2	60.8	
12	357 22.5	S	4 21.7		178 30.7	8.0	N 9 43.1	13.2	60.8	
N 13	12 22.7		20.7		192 57.7	8.0	9 29.9	13.3	60.7	
E 14	27 22.8		19.7		207 24.7	8.1	9 16.6	13.4	60.7	
S 15	42 23.0	. .	18.7		221 51.8	8.2	9 03.2	13.4	60.7	
16	57 23.2		17.8		236 19.0	8.2	8 49.8	13.5	60.7	
17	72 23.3		16.8		250 46.2	8.3	8 36.3	13.5	60.7	
18	87 23.5	S	4 15.8		265 13.5	8.3	N 8 22.8	13.6	60.7	
19	102 23.6		14.8		279 40.8	8.5	8 09.2	13.6	60.6	
20	117 23.8		13.9		294 08.3	8.4	7 55.6	13.6	60.6	
21	132 24.0	. .	12.9		308 35.7	8.5	7 42.0	13.7	60.6	
22	147 24.1		11.9		323 03.2	8.6	7 28.3	13.7	60.6	
23	162 24.3		10.9		337 30.8	8.7	7 14.6	13.8	60.6	
10 00	177 24.4	S	4 09.9		351 58.5	8.7	N 7 00.8	13.8	60.6	
01	192 24.6		09.0		6 26.2	8.7	6 47.0	13.8	60.5	
02	207 24.8		08.0		20 53.9	8.8	6 33.2	13.8	60.5	
03	222 24.9	. .	07.0		35 21.7	8.9	6 19.4	13.9	60.5	
04	237 25.1		06.0		49 49.6	8.9	6 05.5	13.9	60.5	
05	252 25.3		05.0		64 17.5	9.0	5 51.6	13.9	60.5	
06	267 25.4	S	4 04.1		78 45.5	9.1	N 5 37.7	14.0	60.4	
07	282 25.6		03.1		93 13.6	9.0	5 23.7	14.0	60.4	
S 08	297 25.7		02.1		107 41.6	9.2	5 09.7	14.0	60.4	
A 09	312 25.9	. .	01.1		122 09.8	9.2	4 55.7	14.0	60.4	
B 10	327 26.1	4	00.1		136 38.0	9.2	4 41.7	14.0	60.3	
A 11	342 26.2	3	59.2		151 06.2	9.3	4 27.7	14.1	60.3	
12	357 26.4	S	3 58.2		165 34.5	9.3	N 4 13.6	14.0	60.3	
D 13	12 26.6		57.2		180 02.8	9.4	3 59.6	14.1	60.3	
O 14	27 26.7		56.2		194 31.2	9.5	3 45.5	14.1	60.2	
15	42 26.9	. .	55.2		208 59.7	9.5	3 31.4	14.1	60.2	
16	57 27.0		54.3		223 28.2	9.5	3 17.3	14.1	60.2	
17	72 27.2		53.3		237 56.7	9.6	3 03.2	14.1	60.2	
18	87 27.4	S	3 52.3		252 25.3	9.6	N 2 49.1	14.1	60.1	
19	102 27.5		51.3		266 53.9	9.7	2 35.0	14.1	60.1	
20	117 27.7		50.3		281 22.6	9.7	2 20.9	14.1	60.1	
21	132 27.9	. .	49.4		295 51.3	9.8	2 06.8	14.1	60.0	
22	147 28.0		48.4		310 20.1	9.8	1 52.7	14.1	60.0	
23	162 28.2		47.4		324 48.9	9.8	N 1 38.6	14.1	60.0	
	SD 16.1	d	1.0		SD 16.6		16.6		16.4	

Lat.	Crepúsculo Náutico	Crepúsculo Civil	Orto Sol	Orto Luna 8	Orto Luna 9	Orto Luna 10	Orto Luna 11
°	h m	h m	h m	h m	h m	h m	h m
N 72	04 28	05 48	06 55	13 53	16 25	18 41	20 50
N 70	04 38	05 49	06 50	14 24	16 39	18 45	20 45
68	04 45	05 51	06 46	14 46	16 50	18 48	20 41
66	04 52	05 52	06 42	15 04	16 59	18 50	20 37
64	04 57	05 52	06 40	15 18	17 07	18 52	20 34
62	05 01	05 53	06 37	15 30	17 13	18 54	20 32
60	05 05	05 53	06 35	15 40	17 19	18 55	20 29
N 58	05 08	05 54	06 33	15 48	17 24	18 57	20 27
56	05 11	05 54	06 31	15 56	17 28	18 58	20 26
54	05 13	05 54	06 29	16 03	17 32	18 59	20 24
52	05 15	05 54	06 28	16 09	17 35	19 00	20 23
50	05 17	05 54	06 27	16 14	17 39	19 01	20 21
45	05 20	05 54	06 24	16 26	17 45	19 03	20 19
N 40	05 23	05 54	06 21	16 36	17 51	19 05	20 16
35	05 24	05 54	06 19	16 44	17 56	19 06	20 14
30	05 25	05 53	06 17	16 51	18 00	19 08	20 13
20	05 26	05 51	06 14	17 04	18 08	19 10	20 10
N 10	05 25	05 49	06 10	17 15	18 14	19 12	20 07
0	05 22	05 46	06 07	17 25	18 21	19 14	20 05
S 10	05 18	05 43	06 04	17 35	18 27	19 15	20 02
20	05 13	05 38	06 01	17 46	18 33	19 17	20 00
30	05 04	05 32	05 56	17 58	18 41	19 20	19 57
35	04 58	05 28	05 54	18 05	18 45	19 21	19 55
40	04 52	05 24	05 51	18 13	18 50	19 22	19 54
45	04 43	05 18	05 48	18 23	18 55	19 24	19 52
S 50	04 32	05 11	05 44	18 34	19 02	19 26	19 49
52	04 26	05 08	05 42	18 39	19 05	19 27	19 48
54	04 20	05 04	05 40	18 45	19 08	19 28	19 47
56	04 13	05 00	05 38	18 51	19 12	19 29	19 46
58	04 05	04 55	05 35	18 58	19 16	19 31	19 44
S 60	03 56	04 50	05 33	19 06	19 20	19 32	19 42

Lat.	Ocaso Sol	Crepúsculo Civil	Crepúsculo Náutico	Ocaso Luna 8	Ocaso Luna 9	Ocaso Luna 10	Ocaso Luna 11
°	h m	h m	h m	h m	h m	h m	h m
N 72	17 28	18 36	19 57	08 49	08 15	07 52	07 32
N 70	17 33	18 34	19 46	08 16	07 58	07 45	07 33
68	17 37	18 32	19 38	07 52	07 45	07 39	07 33
66	17 40	18 31	19 31	07 33	07 35	07 34	07 34
64	17 43	18 30	19 26	07 18	07 25	07 30	07 34
62	17 45	18 30	19 21	07 05	07 18	07 27	07 34
60	17 47	18 29	19 17	06 54	07 11	07 24	07 35
N 58	17 49	18 28	19 14	06 45	07 05	07 21	07 35
56	17 51	18 28	19 11	06 36	06 59	07 18	07 35
54	17 53	18 28	19 09	06 29	06 54	07 16	07 35
52	17 54	18 28	19 07	06 22	06 50	07 14	07 36
50	17 55	18 27	19 05	06 16	06 46	07 12	07 36
45	17 58	18 27	19 01	06 03	06 37	07 08	07 36
N 40	18 00	18 27	18 59	05 52	06 30	07 04	07 36
35	18 03	18 28	18 57	05 42	06 24	07 01	07 37
30	18 04	18 28	18 56	05 34	06 18	06 59	07 37
20	18 08	18 30	18 55	05 19	06 08	06 54	07 37
N 10	18 11	18 32	18 56	05 07	06 00	06 50	07 38
0	18 14	18 35	18 59	04 55	05 52	06 46	07 38
S 10	18 17	18 38	19 02	04 43	05 43	06 42	07 38
20	18 20	18 42	19 08	04 30	05 35	06 38	07 38
30	18 24	18 48	19 16	04 15	05 24	06 33	07 39
35	18 26	18 52	19 22	04 06	05 18	06 30	07 39
40	18 29	18 56	19 29	03 56	05 12	06 26	07 39
45	18 32	19 02	19 37	03 44	05 04	06 23	07 39
S 50	18 36	19 09	19 48	03 30	04 54	06 18	07 40
52	18 38	19 12	19 53	03 23	04 50	06 16	07 40
54	18 40	19 16	19 59	03 15	04 45	06 13	07 40
56	18 42	19 20	20 06	03 07	04 39	06 11	07 40
58	18 44	19 24	20 14	02 57	04 33	06 08	07 40
S 60	18 47	19 29	20 22	02 47	04 26	06 05	07 40

Día	SOL E.T. (−) 00h	SOL E.T. (−) 12h	SOL Pas. Mer.	LUNA Pas. Mer. Sup.	LUNA Pas. Mer. Inf.	LUNA Edad	LUNA Fase
d	m s	m s	h m	h m	h m	d %	
8	10 53	10 45	12 11	23 38	11 10	13 98	
9	10 38	10 30	12 11	24 33	12 06	14 100	○
10	10 23	10 15	12 10	00 33	13 00	15 99	

(DOM., LUN., MAR.) 11, 12, 13 MARZO DEL 2001

T.U.		ARIES	VENUS −4.5		MARTE +0.3		JUPITER −2.2		SATURNO +0.2	
		A.H.G.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.
d	h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
11	00	168 43.2	155 19.5	N13 41.3	278 10.7	S21 30.0	106 14.2	N20 29.1	114 41.8	N17 23.7
	01	183 45.7	170 22.2	41.5	293 12.0	30.2	121 16.3	29.1	129 44.1	23.8
	02	198 48.1	185 25.0	41.7	308 13.2	30.4	136 18.4	29.2	144 46.4	23.8
	03	213 50.6	200 27.8	42.0	323 14.5	30.6	151 20.5	29.3	159 48.7	23.9
	04	228 53.1	215 30.6	42.2	338 15.7	30.8	166 22.6	29.4	174 50.9	23.9
	05	243 55.5	230 33.5	42.4	353 17.0	31.0	181 24.8	29.4	189 53.2	24.0
	06	258 58.0	245 36.3	N13 42.6	8 18.2	S21 31.2	196 26.9	N20 29.5	204 55.5	N17 24.0
	07	274 00.5	260 39.1	42.8	23 19.5	31.4	211 29.0	29.6	219 57.7	24.1
D	08	289 02.9	275 41.9	43.1	38 20.7	31.6	226 31.1	29.6	235 00.0	24.1
O	09	304 05.4	290 44.7	43.3	53 22.0	31.8	241 33.2	29.7	250 02.3	24.2
M	10	319 07.9	305 47.5	43.5	68 23.2	31.9	256 35.3	29.8	265 04.5	24.3
I	11	334 10.3	320 50.4	43.7	83 24.5	32.1	271 37.4	29.8	280 06.8	24.3
N	12	349 12.8	335 53.2	N13 43.9	98 25.7	S21 32.3	286 39.6	N20 29.9	295 09.1	N17 24.4
G	13	4 15.2	350 56.0	44.1	113 27.0	32.5	301 41.7	30.0	310 11.3	24.4
O	14	19 17.7	5 58.9	44.3	128 28.2	32.7	316 43.8	30.0	325 13.6	24.5
	15	34 20.2	21 01.7	44.5	143 29.5	32.9	331 45.9	30.1	340 15.9	24.5
	16	49 22.6	36 04.6	44.7	158 30.7	33.1	346 48.0	30.2	355 18.1	24.6
	17	64 25.1	51 07.4	44.9	173 32.0	33.3	1 50.1	30.3	10 20.4	24.6
	18	79 27.6	66 10.3	N13 45.1	188 33.2	S21 33.4	16 52.2	N20 30.3	25 22.7	N17 24.7
	19	94 30.0	81 13.2	45.3	203 34.5	33.6	31 54.4	30.4	40 25.0	24.7
	20	109 32.5	96 16.0	45.5	218 35.7	33.8	46 56.5	30.5	55 27.2	24.8
	21	124 35.0	111 18.9	45.7	233 37.0	34.0	61 58.6	30.5	70 29.5	24.9
	22	139 37.4	126 21.8	45.9	248 38.2	34.2	77 00.7	30.6	85 31.8	24.9
	23	154 39.9	141 24.6	46.0	263 39.5	34.4	92 02.8	30.7	100 34.0	25.0
12	00	169 42.4	156 27.5	N13 46.2	278 40.7	S21 34.6	107 04.9	N20 30.7	115 36.3	N17 25.0
	01	184 44.8	171 30.4	46.4	293 42.0	34.8	122 07.0	30.8	130 38.6	25.1
	02	199 47.3	186 33.3	46.6	308 43.3	34.9	137 09.1	30.9	145 40.8	25.1
	03	214 49.7	201 36.2	46.8	323 44.5	35.1	152 11.2	31.0	160 43.1	25.2
	04	229 52.2	216 39.1	46.9	338 45.8	35.3	167 13.3	31.0	175 45.3	25.2
	05	244 54.7	231 42.0	47.1	353 47.0	35.5	182 15.5	31.1	190 47.6	25.3
	06	259 57.1	246 44.9	N13 47.3	8 48.3	S21 35.7	197 17.6	N20 31.2	205 49.9	N17 25.4
	07	274 59.6	261 47.8	47.4	23 49.5	35.9	212 19.7	31.2	220 52.1	25.4
	08	290 02.1	276 50.7	47.6	38 50.8	36.1	227 21.8	31.3	235 54.4	25.5
L	09	305 04.5	291 53.6	47.7	53 52.1	36.2	242 23.9	31.4	250 56.7	25.5
U	10	320 07.0	306 56.5	47.9	68 53.3	36.4	257 26.0	31.4	265 58.9	25.6
N	11	335 09.5	321 59.4	48.1	83 54.6	36.6	272 28.1	31.5	281 01.2	25.6
E	12	350 11.9	337 02.4	N13 48.2	98 55.8	S21 36.8	287 30.2	N20 31.6	296 03.5	N17 25.7
S	13	5 14.4	352 05.3	48.4	113 57.1	37.0	302 32.3	31.7	311 05.7	25.7
	14	20 16.8	7 08.2	48.5	128 58.4	37.2	317 34.4	31.7	326 08.0	25.8
	15	35 19.3	22 11.2	48.6	143 59.6	37.3	332 36.5	31.8	341 10.3	25.9
	16	50 21.8	37 14.1	48.8	159 00.9	37.5	347 38.6	31.9	356 12.5	25.9
	17	65 24.2	52 17.1	48.9	174 02.1	37.7	2 40.7	31.9	11 14.8	26.0
	18	80 26.7	67 20.0	N13 49.1	189 03.4	S21 37.9	17 42.9	N20 32.0	26 17.1	N17 26.0
	19	95 29.2	82 23.0	49.2	204 04.7	38.1	32 45.0	32.1	41 19.3	26.1
	20	110 31.6	97 25.9	49.3	219 05.9	38.3	47 47.1	32.2	56 21.6	26.1
	21	125 34.1	112 28.9	49.5	234 07.2	38.5	62 49.2	32.2	71 23.8	26.2
	22	140 36.6	127 31.8	49.6	249 08.4	38.6	77 51.3	32.3	86 26.1	26.2
	23	155 39.0	142 34.8	49.7	264 09.7	38.8	92 53.4	32.4	101 28.4	26.3
13	00	170 41.5	157 37.8	N13 49.8	279 11.0	S21 39.0	107 55.5	N20 32.4	116 30.6	N17 26.4
	01	185 44.0	172 40.8	50.0	294 12.2	39.2	122 57.6	32.5	131 32.9	26.4
	02	200 46.4	187 43.7	50.1	309 13.5	39.4	137 59.7	32.6	146 35.2	26.5
	03	215 48.9	202 46.7	50.2	324 14.8	39.5	153 01.8	32.6	161 37.4	26.5
	04	230 51.3	217 49.7	50.3	339 16.0	39.7	168 03.9	32.7	176 39.7	26.6
	05	245 53.8	232 52.7	50.4	354 17.3	39.9	183 06.0	32.8	191 42.0	26.6
	06	260 56.3	247 55.7	N13 50.5	9 18.6	S21 40.1	198 08.1	N20 32.9	206 44.2	N17 26.7
	07	275 58.7	262 58.7	50.6	24 19.8	40.3	213 10.2	32.9	221 46.5	26.8
M	08	291 01.2	278 01.7	50.7	39 21.1	40.5	228 12.3	33.0	236 48.7	26.8
A	09	306 03.7	293 04.7	50.8	54 22.4	40.6	243 14.4	33.1	251 51.0	26.9
R	10	321 06.1	308 07.7	50.9	69 23.6	40.8	258 16.5	33.1	266 53.3	26.9
T	11	336 08.6	323 10.7	51.0	84 24.9	41.0	273 18.6	33.2	281 55.5	27.0
E	12	351 11.1	338 13.7	N13 51.1	99 26.2	S21 41.2	288 20.7	N20 33.3	296 57.8	N17 27.0
S	13	6 13.5	353 16.7	51.2	114 27.4	41.4	303 22.8	33.4	312 00.0	27.1
	14	21 16.0	8 19.8	51.3	129 28.7	41.5	318 24.9	33.4	327 02.3	27.1
	15	36 18.4	23 22.8	51.4	144 30.0	41.7	333 27.0	33.5	342 04.6	27.2
	16	51 20.9	38 25.8	51.5	159 31.2	41.9	348 29.1	33.6	357 06.8	27.3
	17	66 23.4	53 28.9	51.6	174 32.5	42.1	3 31.2	33.6	12 09.1	27.3
	18	81 25.8	68 31.9	N13 51.7	189 33.8	S21 42.3	18 33.3	N20 33.7	27 11.3	N17 27.4
	19	96 28.3	83 34.9	51.7	204 35.0	42.4	33 35.4	33.8	42 13.6	27.4
	20	111 30.8	98 38.0	51.8	219 36.3	42.6	48 37.5	33.9	57 15.9	27.5
	21	126 33.2	113 41.0	51.9	234 37.6	42.8	63 39.6	33.9	72 18.1	27.5
	22	141 35.7	128 44.1	51.9	249 38.9	43.0	78 41.7	34.0	87 20.4	27.6
	23	156 38.2	143 47.1	52.0	264 40.1	43.2	93 43.8	34.1	102 22.6	27.7
Pas. Mer.		h m 12 39.1	*v* 2.9	*d* 0.2	*v* 1.3	*d* 0.2	*v* 2.1	*d* 0.1	*v* 2.3	*d* 0.1

ESTRELLAS

Nombre	A.H.S. ° ′	Dec. ° ′
Acamar	315 25.8	S40 18.4
Achernar	335 34.3	S57 14.2
Acrux	173 19.5	S63 06.2
Adhara	255 20.0	S28 58.7
Aldebaran	291 00.5	N16 30.6
Alioth	166 28.5	N55 57.1
Alkaid	153 06.0	N49 18.3
Al Na'ir	27 56.1	S46 57.4
Alnilam	275 56.1	S 1 12.2
Alphard	218 05.3	S 8 39.9
Alphecca	126 19.0	N26 42.5
Alpheratz	357 53.9	N29 05.6
Altair	62 17.8	N 8 52.1
Ankaa	353 25.5	S42 18.2
Antares	112 38.0	S26 26.0
Arcturus	146 04.3	N19 10.5
Atria	107 48.5	S69 01.5
Avior	234 21.6	S59 31.0
Bellatrix	278 42.3	N 6 20.9
Betelgeuse	271 11.7	N 7 24.3
Canopus	264 00.3	S52 42.1
Capella	280 48.7	N46 00.0
Deneb	49 38.4	N45 16.8
Denebola	182 43.1	N14 33.9
Diphda	349 05.8	S17 59.1
Dubhe	194 02.7	N61 44.7
Elnath	278 24.8	N28 36.5
Eltanin	90 50.7	N51 29.0
Enif	33 56.9	N 9 52.6
Fomalhaut	15 34.9	S29 37.2
Gacrux	172 11.2	S57 07.1
Gienah	176 01.9	S17 32.9
Hadar	149 01.2	S60 22.5
Hamal	328 11.9	N23 27.9
Kaus Aust.	83 56.7	S34 23.0
Kochab	137 18.8	N74 08.9
Markab	13 48.3	N15 12.5
Menkar	314 25.3	N 4 05.5
Menkent	148 18.7	S36 22.4
Miaplacidus	221 41.1	S69 43.5
Mirfak	308 54.5	N49 52.0
Nunki	76 10.4	S26 17.7
Peacock	53 34.7	S56 43.8
Pollux	243 39.3	N28 01.4
Procyon	245 09.6	N 5 13.2
Rasalhague	96 15.4	N12 33.4
Regulus	207 53.4	N11 57.7
Rigel	281 21.3	S 8 12.2
Rigil Kent.	140 04.6	S60 50.1
Sabik	102 23.6	S15 43.6
Schedar	349 52.2	N56 32.5
Shaula	96 35.0	S37 06.2
Sirius	258 42.1	S16 43.3
Spica	158 41.1	S11 10.0
Suhail	222 59.2	S43 26.4
Vega	80 45.6	N38 46.8
Zuben'ubi	137 15.9	S16 02.8

	A.H.S. ° ′	Pas. Mer. h m
Venus	346 45.2	13 32
Marte	108 58.4	5 25
Júpiter	297 22.6	16 49
Saturno	305 53.9	16 15

T.U.	SOL				LUNA					
	A.H.G.		Dec.		A.H.G.	v	Dec.	d	P.H.	
d h	° ′		° ′		° ′	′	° ′	′	′	
11 00	177 28.4	S	3 46.4		339 17.7	9.9	N 1 24.5	14.1	60.0	
01	192 28.5		45.4		353 46.6	9.9	1 10.4	14.1	59.9	
02	207 28.7		44.5		8 15.5	10.0	0 56.3	14.1	59.9	
03	222 28.9		43.5		22 44.5	10.0	0 42.2	14.0	59.9	
04	237 29.0		42.5		37 13.5	10.0	0 28.2	14.1	59.8	
05	252 29.2		41.5		51 42.5	10.1	0 14.1	14.0	59.8	
06	267 29.3	S	3 40.5		66 11.6	10.2	N 0 00.1	14.1	59.8	
07	282 29.5		39.5		80 40.8	10.1	S 0 14.0	14.0	59.7	
08	297 29.7		38.6		95 09.9	10.2	0 28.0	14.0	59.7	
D 09	312 29.8		37.6		109 39.1	10.2	0 42.0	13.9	59.7	
O 10	327 30.0		36.6		124 08.3	10.3	0 55.9	14.0	59.6	
M 11	342 30.2		35.6		138 37.6	10.3	1 09.9	13.9	59.6	
I 12	357 30.3	S	3 34.6		153 06.9	10.3	S 1 23.8	13.9	59.6	
N 13	12 30.5		33.7		167 36.2	10.4	1 37.7	13.9	59.6	
G 14	27 30.7		32.7		182 05.6	10.3	1 51.6	13.8	59.5	
O 15	42 30.8		31.7		196 34.9	10.5	2 05.4	13.9	59.5	
16	57 31.0		30.7		211 04.4	10.4	2 19.3	13.8	59.4	
17	72 31.2		29.7		225 33.8	10.5	2 33.1	13.7	59.4	
18	87 31.3	S	3 28.7		240 03.3	10.5	S 2 46.8	13.8	59.4	
19	102 31.5		27.8		254 32.8	10.5	3 00.6	13.7	59.3	
20	117 31.7		26.8		269 02.3	10.6	3 14.3	13.6	59.3	
21	132 31.8		25.8		283 31.9	10.6	3 27.9	13.7	59.3	
22	147 32.0		24.8		298 01.5	10.6	3 41.6	13.6	59.2	
23	162 32.2		23.8		312 31.1	10.6	3 55.2	13.5	59.2	
12 00	177 32.3	S	3 22.8		327 00.7	10.7	S 4 08.7	13.5	59.2	
01	192 32.5		21.9		341 30.4	10.6	4 22.2	13.5	59.1	
02	207 32.7		20.9		356 00.0	10.7	4 35.7	13.4	59.1	
03	222 32.8		19.9		10 29.7	10.8	4 49.1	13.4	59.1	
04	237 33.0		18.9		24 59.5	10.7	5 02.5	13.4	59.0	
05	252 33.2		17.9		39 29.2	10.8	5 15.9	13.3	59.0	
06	267 33.4	S	3 16.9		53 59.0	10.8	S 5 29.2	13.2	58.9	
07	282 33.5		16.0		68 28.8	10.8	5 42.4	13.2	58.9	
08	297 33.7		15.0		82 58.6	10.8	5 55.6	13.2	58.9	
L 09	312 33.9		14.0		97 28.4	10.8	6 08.8	13.1	58.8	
U 10	327 34.0		13.0		111 58.2	10.9	6 21.9	13.0	58.8	
N 11	342 34.2		12.0		126 28.1	10.8	6 34.9	13.0	58.8	
E 12	357 34.4	S	3 11.0		140 57.9	10.9	S 6 47.9	13.0	58.7	
S 13	12 34.5		10.1		155 27.8	10.9	7 00.9	12.9	58.7	
14	27 34.7		09.1		169 57.7	10.9	7 13.8	12.8	58.6	
15	42 34.9		08.1		184 27.6	11.0	7 26.6	12.8	58.6	
16	57 35.0		07.1		198 57.6	10.9	7 39.4	12.7	58.6	
17	72 35.2		06.1		213 27.5	10.9	7 52.1	12.7	58.5	
18	87 35.4	S	3 05.1		227 57.4	11.0	S 8 04.8	12.6	58.5	
19	102 35.6		04.2		242 27.4	11.0	8 17.4	12.5	58.5	
20	117 35.7		03.2		256 57.4	11.0	8 29.9	12.5	58.4	
21	132 35.9		02.2		271 27.4	11.0	8 42.4	12.4	58.4	
22	147 36.1		01.2		285 57.4	11.0	8 54.8	12.4	58.3	
23	162 36.2		3 00.2		300 27.4	11.0	9 07.2	12.2	58.3	
13 00	177 36.4	S	2 59.2		314 57.4	11.0	S 9 19.4	12.3	58.3	
01	192 36.6		58.3		329 27.4	11.0	9 31.7	12.1	58.2	
02	207 36.7		57.3		343 57.4	11.0	9 43.8	12.1	58.2	
03	222 36.9		56.3		358 27.4	11.1	9 55.9	12.0	58.1	
04	237 37.1		55.3		12 57.5	11.0	10 07.9	12.0	58.1	
05	252 37.3		54.3		27 27.5	11.1	10 19.9	11.9	58.1	
06	267 37.4	S	2 53.3		41 57.6	11.0	S10 31.8	11.8	58.0	
07	282 37.6		52.3		56 27.6	11.1	10 43.6	11.7	58.0	
08	297 37.8		51.4		70 57.7	11.1	10 55.3	11.7	58.0	
09	312 37.9		50.4		85 27.8	11.0	11 07.0	11.5	57.9	
M 10	327 38.1		49.4		99 57.8	11.1	11 18.5	11.5	57.9	
A 11	342 38.3		48.4		114 27.9	11.1	11 30.0	11.5	57.8	
R 12	357 38.5	S	2 47.4		128 58.0	11.0	S11 41.5	11.3	57.8	
T 13	12 38.6		46.4		143 28.0	11.1	11 52.8	11.3	57.8	
E 14	27 38.8		45.5		157 58.1	11.1	12 04.1	11.2	57.7	
S 15	42 39.0		44.5		172 28.2	11.1	12 15.3	11.2	57.7	
16	57 39.1		43.5		186 58.3	11.0	12 26.5	11.0	57.6	
17	72 39.3		42.5		201 28.3	11.1	12 37.5	11.0	57.6	
18	87 39.5	S	2 41.5		215 58.4	11.1	S12 48.5	10.8	57.6	
19	102 39.7		40.5		230 28.5	11.1	12 59.3	10.8	57.5	
20	117 39.8		39.5		244 58.6	11.0	13 10.1	10.8	57.5	
21	132 40.0		38.6		259 28.6	11.1	13 20.9	10.6	57.4	
22	147 40.2		37.6		273 58.7	11.1	13 31.5	10.5	57.4	
23	162 40.4		36.6		288 28.8	11.0	S13 42.0	10.5	57.4	
	SD 16.1		d 1.0		SD 16.2		16.0		15.7	

Lat.	Crepúsculo Náutico	Crepúsculo Civil	Orto Sol	Orto Luna 11	Orto Luna 12	Orto Luna 13	Orto Luna 14
°	h m	h m	h m	h m	h m	h m	h m
N 72	04 11	05 33	06 39	20 50	22 59	25 16	01 16
N 70	04 23	05 36	06 36	20 45	22 43	24 45	00 45
68	04 32	05 38	06 33	20 41	22 31	24 22	00 22
66	04 40	05 40	06 31	20 37	22 22	24 05	00 05
64	04 46	05 42	06 29	20 34	22 13	23 51	25 25
62	04 51	05 43	06 27	20 32	22 06	23 39	25 08
60	04 56	05 45	06 26	20 29	22 00	23 29	24 54
N 58	05 00	05 46	06 24	20 27	21 55	23 20	24 41
56	05 03	05 46	06 23	20 26	21 50	23 13	24 31
54	05 06	05 47	06 22	20 24	21 46	23 06	24 22
52	05 08	05 48	06 21	20 23	21 43	23 00	24 13
50	05 11	05 48	06 20	20 21	21 39	22 54	24 06
45	05 15	05 49	06 18	20 19	21 32	22 42	23 50
N 40	05 18	05 49	06 16	20 16	21 26	22 33	23 38
35	05 20	05 50	06 15	20 14	21 20	22 25	23 27
30	05 22	05 50	06 14	20 13	21 16	22 17	23 17
20	05 23	05 49	06 11	20 10	21 08	22 05	23 01
N 10	05 23	05 48	06 09	20 07	21 01	21 54	22 47
0	05 22	05 46	06 06	20 05	20 55	21 44	22 34
S 10	05 19	05 43	06 04	20 02	20 48	21 34	22 21
20	05 14	05 39	06 01	20 00	20 41	21 24	22 07
30	05 06	05 34	05 58	19 57	20 34	21 12	21 51
35	05 01	05 31	05 56	19 55	20 30	21 05	21 42
40	04 55	05 27	05 54	19 54	20 25	20 57	21 31
45	04 47	05 22	05 52	19 52	20 19	20 48	21 19
S 50	04 37	05 16	05 49	19 49	20 12	20 37	21 04
52	04 32	05 13	05 47	19 48	20 09	20 32	20 58
54	04 27	05 10	05 46	19 47	20 06	20 26	20 50
56	04 21	05 07	05 44	19 46	20 02	20 20	20 42
58	04 14	05 02	05 42	19 44	19 58	20 13	20 32
S 60	04 05	04 58	05 40	19 42	19 53	20 06	20 21

Lat.	Ocaso Sol	Crepúsculo Civil	Crepúsculo Náutico	Ocaso Luna 11	Ocaso Luna 12	Ocaso Luna 13	Ocaso Luna 14
°	h m	h m	h m	h m	h m	h m	h m
N 72	17 42	18 50	20 12	07 32	07 12	06 49	06 17
N 70	17 45	18 46	20 00	07 33	07 20	07 07	06 49
68	17 48	18 43	19 50	07 33	07 27	07 21	07 13
66	17 50	18 41	19 42	07 34	07 33	07 32	07 32
64	17 52	18 39	19 35	07 34	07 37	07 41	07 47
62	17 53	18 38	19 30	07 34	07 42	07 50	08 00
60	17 55	18 36	19 25	07 35	07 45	07 57	08 11
N 58	17 56	18 35	19 21	07 35	07 49	08 03	08 20
56	17 57	18 34	19 18	07 35	07 51	08 09	08 28
54	17 58	18 34	19 15	07 35	07 54	08 14	08 36
52	17 59	18 33	19 12	07 36	07 57	08 18	08 42
50	18 00	18 32	19 10	07 36	07 59	08 22	08 48
45	18 02	18 31	19 05	07 36	08 03	08 31	09 01
N 40	18 04	18 31	19 02	07 36	08 07	08 39	09 12
35	18 05	18 30	19 00	07 37	08 11	08 45	09 22
30	18 06	18 30	18 58	07 37	08 14	08 51	09 30
20	18 09	18 31	18 56	07 37	08 19	09 01	09 44
N 10	18 11	18 32	18 56	07 38	08 24	09 10	09 56
0	18 13	18 34	18 58	07 38	08 28	09 18	10 08
S 10	18 15	18 36	19 01	07 38	08 33	09 26	10 19
20	18 18	18 40	19 05	07 38	08 38	09 35	10 32
30	18 21	18 45	19 13	07 39	08 43	09 45	10 46
35	18 22	18 48	19 17	07 39	08 46	09 51	10 55
40	18 24	18 52	19 23	07 39	08 50	09 58	11 04
45	18 27	18 56	19 31	07 39	08 54	10 06	11 15
S 50	18 30	19 02	19 41	07 40	08 59	10 15	11 29
52	18 31	19 05	19 46	07 40	09 01	10 20	11 35
54	18 32	19 08	19 51	07 40	09 03	10 24	11 42
56	18 34	19 11	19 57	07 40	09 06	10 30	11 50
58	18 36	19 15	20 04	07 40	09 09	10 36	11 59
S 60	18 38	19 20	20 12	07 40	09 13	10 42	12 09

Día	SOL E.T. (−) 00h	SOL E.T. (−) 12h	SOL Pas. Mer.	LUNA Pas. Mer. Sup.	LUNA Pas. Mer. Inf.	LUNA Edad	LUNA Fase
d	m s	m s	h m	h m	h m	d	%
11	10 07	09 59	12 10	01 26	13 51	16	95
12	09 51	09 43	12 10	02 17	14 42	17	90
13	09 35	09 27	12 09	03 06	15 31	18	82

T.U.	ARIES	VENUS −4.4		MARTE +0.2		JUPITER −2.2		SATURNO +0.2	
	A.H.G.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
14 00	171 40.6	158 50.2	N13 52.1	279 41.4	S21 43.3	108 45.9	N20 34.1	117 24.9	N17 27.7
01	186 43.1	173 53.3	52.1	294 42.7	43.5	123 48.0	34.2	132 27.2	27.8
02	201 45.6	188 56.3	52.2	309 43.9	43.7	138 50.1	34.3	147 29.4	27.8
03	216 48.0	203 59.4	52.3	324 45.2	43.9	153 52.2	34.4	162 31.7	27.9
04	231 50.5	219 02.5	52.3	339 46.5	44.1	168 54.3	34.4	177 33.9	27.9
05	246 52.9	234 05.6	52.4	354 47.8	44.2	183 56.4	34.5	192 36.2	28.0
06	261 55.4	249 08.7	N13 52.4	9 49.0	S21 44.4	198 58.5	N20 34.6	207 38.5	N17 28.1
M 07	276 57.9	264 11.7	52.5	24 50.3	44.6	214 00.6	34.6	222 40.7	28.1
I 08	292 00.3	279 14.8	52.5	39 51.6	44.8	229 02.7	34.7	237 43.0	28.2
E 09	307 02.8	294 17.9	52.6	54 52.9	44.9	244 04.8	34.8	252 45.2	28.2
R 10	322 05.3	309 21.0	52.6	69 54.1	45.1	259 06.9	34.9	267 47.5	28.3
C 11	337 07.7	324 24.1	52.6	84 55.4	45.3	274 09.0	34.9	282 49.8	28.3
O 12	352 10.2	339 27.2	N13 52.7	99 56.7	S21 45.5	289 11.1	N20 35.0	297 52.0	N17 28.4
L 13	7 12.7	354 30.3	52.7	114 58.0	45.7	304 13.2	35.1	312 54.3	28.5
E 14	22 15.1	9 33.5	52.7	129 59.2	45.8	319 15.3	35.1	327 56.5	28.5
S 15	37 17.6	24 36.6	52.8	145 00.5	46.0	334 17.4	35.2	342 58.8	28.6
16	52 20.1	39 39.7	52.8	160 01.8	46.2	349 19.4	35.3	358 01.0	28.6
17	67 22.5	54 42.8	52.8	175 03.1	46.4	4 21.5	35.4	13 03.3	28.7
18	82 25.0	69 45.9	N13 52.8	190 04.4	S21 46.5	19 23.6	N20 35.4	28 05.6	N17 28.7
19	97 27.4	84 49.1	52.9	205 05.6	46.7	34 25.7	35.5	43 07.8	28.8
20	112 29.9	99 52.2	52.9	220 06.9	46.9	49 27.8	35.6	58 10.1	28.9
21	127 32.4	114 55.3	52.9	235 08.2	47.1	64 29.9	35.6	73 12.3	28.9
22	142 34.8	129 58.5	52.9	250 09.5	47.2	79 32.0	35.7	88 14.6	29.0
23	157 37.3	145 01.6	52.9	265 10.8	47.4	94 34.1	35.8	103 16.8	29.0
15 00	172 39.8	160 04.8	N13 52.9	280 12.0	S21 47.6	109 36.2	N20 35.9	118 19.1	N17 29.1
01	187 42.2	175 07.9	52.9	295 13.3	47.8	124 38.3	35.9	133 21.3	29.1
02	202 44.7	190 11.1	52.9	310 14.6	47.9	139 40.4	36.0	148 23.6	29.2
03	217 47.2	205 14.2	52.9	325 15.9	48.1	154 42.5	36.1	163 25.9	29.3
04	232 49.6	220 17.4	52.9	340 17.2	48.3	169 44.6	36.1	178 28.1	29.3
05	247 52.1	235 20.6	52.9	355 18.5	48.5	184 46.7	36.2	193 30.4	29.4
06	262 54.5	250 23.8	N13 52.9	10 19.7	S21 48.6	199 48.7	N20 36.3	208 32.6	N17 29.4
07	277 57.0	265 26.9	52.9	25 21.0	48.8	214 50.8	36.4	223 34.9	29.5
J 08	292 59.5	280 30.1	52.9	40 22.3	49.0	229 52.9	36.4	238 37.1	29.5
U 09	308 01.9	295 33.3	52.8	55 23.6	49.2	244 55.0	36.5	253 39.4	29.6
E 10	323 04.4	310 36.5	52.8	70 24.9	49.3	259 57.1	36.6	268 41.6	29.7
V 11	338 06.9	325 39.7	52.8	85 26.2	49.5	274 59.2	36.6	283 43.9	29.7
E 12	353 09.3	340 42.9	N13 52.8	100 27.4	S21 49.7	290 01.3	N20 36.7	298 46.2	N17 29.8
S 13	8 11.8	355 46.0	52.8	115 28.7	49.9	305 03.4	36.8	313 48.4	29.8
14	23 14.3	10 49.2	52.7	130 30.0	50.0	320 05.5	36.9	328 50.7	29.9
15	38 16.7	25 52.4	52.7	145 31.3	50.2	335 07.5	36.9	343 52.9	29.9
16	53 19.2	40 55.7	52.7	160 32.6	50.4	350 09.6	37.0	358 55.2	30.0
17	68 21.7	55 58.9	52.6	175 33.9	50.6	5 11.7	37.1	13 57.4	30.1
18	83 24.1	71 02.1	N13 52.6	190 35.2	S21 50.7	20 13.8	N20 37.2	28 59.7	N17 30.1
19	98 26.6	86 05.3	52.5	205 36.5	50.9	35 15.9	37.2	44 01.9	30.2
20	113 29.0	101 08.5	52.5	220 37.7	51.1	50 18.0	37.3	59 04.2	30.2
21	128 31.5	116 11.7	52.4	235 39.0	51.2	65 20.1	37.4	74 06.4	30.3
22	143 34.0	131 15.0	52.4	250 40.3	51.4	80 22.2	37.4	89 08.7	30.3
23	158 36.4	146 18.2	52.3	265 41.6	51.6	95 24.2	37.5	104 10.9	30.4
16 00	173 38.9	161 21.4	N13 52.3	280 42.9	S21 51.8	110 26.3	N20 37.6	119 13.2	N17 30.5
01	188 41.4	176 24.7	52.2	295 44.2	51.9	125 28.4	37.7	134 15.4	30.5
02	203 43.8	191 27.9	52.2	310 45.5	52.1	140 30.5	37.7	149 17.7	30.6
03	218 46.3	206 31.2	52.1	325 46.8	52.3	155 32.6	37.8	164 19.9	30.6
04	233 48.8	221 34.4	52.0	340 48.1	52.4	170 34.7	37.9	179 22.2	30.7
05	248 51.2	236 37.7	52.0	355 49.4	52.6	185 36.8	37.9	194 24.5	30.7
06	263 53.7	251 40.9	N13 51.9	10 50.7	S21 52.8	200 38.8	N20 38.0	209 26.7	N17 30.8
07	278 56.2	266 44.2	51.8	25 51.9	53.0	215 40.9	38.1	224 29.0	30.9
08	293 58.6	281 47.4	51.8	40 53.2	53.1	230 43.0	38.2	239 31.2	30.9
V 09	309 01.1	296 50.7	51.7	55 54.5	53.3	245 45.1	38.2	254 33.5	31.0
I 10	324 03.5	311 54.0	51.6	70 55.8	53.5	260 47.2	38.3	269 35.7	31.0
E 11	339 06.0	326 57.2	51.5	85 57.1	53.6	275 49.3	38.4	284 38.0	31.1
R 12	354 08.5	342 00.5	N13 51.4	100 58.4	S21 53.8	290 51.4	N20 38.5	299 40.2	N17 31.2
N 13	9 10.9	357 03.8	51.3	115 59.7	54.0	305 53.4	38.5	314 42.5	31.2
E 14	24 13.4	12 07.1	51.2	131 01.0	54.1	320 55.5	38.6	329 44.7	31.3
S 15	39 15.9	27 10.4	51.1	146 02.3	54.3	335 57.6	38.7	344 47.0	31.3
16	54 18.3	42 13.7	51.1	161 03.6	54.5	350 59.7	38.7	359 49.2	31.4
17	69 20.8	57 17.0	51.0	176 04.9	54.7	6 01.8	38.8	14 51.5	31.4
18	84 23.3	72 20.3	N13 50.9	191 06.2	S21 54.8	21 03.9	N20 38.9	29 53.7	N17 31.5
19	99 25.7	87 23.6	50.7	206 07.5	55.0	36 05.9	39.0	44 56.0	31.6
20	114 28.2	102 26.9	50.6	221 08.8	55.2	51 08.0	39.0	59 58.2	31.6
21	129 30.7	117 30.2	50.5	236 10.1	55.3	66 10.1	39.1	75 00.5	31.7
22	144 33.1	132 33.5	50.4	251 11.4	55.5	81 12.2	39.2	90 02.7	31.7
23	159 35.6	147 36.8	50.3	266 12.7	55.7	96 14.3	39.3	105 05.0	31.8
	h m								
Pas. Mer.	12 27.3	*v* 3.2	*d* 0.0	*v* 1.3	*d* 0.2	*v* 2.1	*d* 0.1	*v* 2.3	*d* 0.1

ESTRELLAS		
Nombre	A.H.S.	Dec.
	° ′	° ′
Acamar	315 25.9	S40 18.4
Achernar	335 34.3	S57 14.2
Acrux	173 19.5	S63 06.2
Adhara	255 20.0	S28 58.7
Aldebaran	291 00.5	N16 30.6
Alioth	166 28.5	N55 57.1
Alkaid	153 06.0	N49 18.3
Al Na'ir	27 56.1	S46 57.4
Alnilam	275 56.1	S 1 12.3
Alphard	218 05.3	S 8 39.9
Alphecca	126 19.0	N26 42.5
Alpheratz	357 53.9	N29 05.6
Altair	62 17.8	N 8 52.1
Ankaa	353 25.5	S42 18.2
Antares	112 38.0	S26 26.0
Arcturus	146 04.2	N19 10.5
Atria	107 48.4	S69 01.5
Avior	234 21.6	S59 31.0
Bellatrix	278 42.3	N 6 20.9
Betelgeuse	271 11.7	N 7 24.3
Canopus	264 00.3	S52 42.1
Capella	280 48.7	N46 00.0
Deneb	49 38.4	N45 16.8
Denebola	182 43.1	N14 33.9
Diphda	349 05.8	S17 59.1
Dubhe	194 02.7	N61 44.7
Elnath	278 24.8	N28 36.5
Eltanin	90 50.7	N51 29.0
Enif	33 56.8	N 9 52.6
Fomalhaut	15 34.9	S29 37.1
Gacrux	172 11.2	S57 07.1
Gienah	176 01.9	S17 32.9
Hadar	149 01.2	S60 22.5
Hamal	328 11.9	N23 27.9
Kaus Aust.	83 56.6	S34 23.0
Kochab	137 18.7	N74 08.9
Markab	13 48.3	N15 12.5
Menkar	314 25.3	N 4 05.5
Menkent	148 18.7	S36 22.4
Miaplacidus	221 41.1	S69 43.5
Mirfak	308 54.5	N49 52.0
Nunki	76 10.3	S26 17.7
Peacock	53 34.7	S56 43.8
Pollux	243 39.3	N28 01.4
Procyon	245 09.6	N 5 13.2
Rasalhague	96 15.4	N12 33.4
Regulus	207 53.4	N11 57.7
Rigel	281 21.3	S 8 12.2
Rigil Kent.	140 04.6	S60 50.2
Sabik	102 23.5	S15 43.6
Schedar	349 52.2	N56 32.5
Shaula	96 35.0	S37 06.2
Sirius	258 42.1	S16 43.3
Spica	158 41.1	S11 10.0
Suhail	222 59.2	S43 26.4
Vega	80 45.6	N38 46.8
Zuben'ubi	137 15.9	S16 02.8

	A.H.S.	Pas. Mer.
	° ′	h m
Venus	347 25.0	13 17
Marte	107 32.3	5 19
Júpiter	296 56.4	16 39
Saturno	305 39.3	16 04

T.U.	SOL				LUNA						
	A.H.G.		Dec.		A.H.G.	v	Dec.	d	P.H.		
d h	° ′		° ′		° ′	′	° ′	′	′		
MIERCOLES 14 00	177 40.5	S	2 35.6		302 58.8	11.1	S13 52.5	10.4	57.3		
01	192 40.7		34.6		317 28.9	11.1	14 02.9	10.3	57.3		
02	207 40.9		33.6		331 59.0	11.0	14 13.2	10.2	57.3		
03	222 41.0	. .	32.6		346 29.0	11.1	14 23.4	10.1	57.2		
04	237 41.2		31.7		0 59.1	11.0	14 33.5	10.0	57.2		
05	252 41.4		30.7		15 29.1	11.1	14 43.5	10.0	57.1		
06	267 41.6	S	2 29.7		29 59.2	11.0	S14 53.5	9.8	57.1		
07	282 41.7		28.7		44 29.2	11.1	15 03.3	9.8	57.1		
08	297 41.9		27.7		58 59.3	11.0	15 13.1	9.7	57.0		
09	312 42.1	. .	26.7		73 29.3	11.0	15 22.8	9.6	57.0		
10	327 42.3		25.7		87 59.3	11.0	15 32.4	9.4	57.0		
11	342 42.4		24.7		102 29.3	11.0	15 41.8	9.4	56.9		
12	357 42.6	S	2 23.8		116 59.3	11.1	S15 51.2	9.3	56.9		
13	12 42.8		22.8		131 29.4	11.0	16 00.5	9.3	56.8		
14	27 43.0		21.8		145 59.4	11.0	16 09.8	9.1	56.8		
15	42 43.1	. .	20.8		160 29.4	10.9	16 18.9	9.0	56.8		
16	57 43.3		19.8		174 59.3	11.0	16 27.9	8.9	56.7		
17	72 43.5		18.8		189 29.3	11.0	16 36.8	8.8	56.7		
18	87 43.7	S	2 17.8		203 59.3	11.0	S16 45.6	8.8	56.7		
19	102 43.8		16.9		218 29.3	11.0	16 54.4	8.6	56.6		
20	117 44.0		15.9		232 59.3	10.9	17 03.0	8.6	56.6		
21	132 44.2	. .	14.9		247 29.2	11.0	17 11.6	8.4	56.6		
22	147 44.4		13.9		261 59.2	10.9	17 20.0	8.3	56.5		
23	162 44.5		12.9		276 29.1	10.9	17 28.3	8.3	56.5		
JUEVES 15 00	177 44.7	S	2 11.9		290 59.0	11.0	S17 36.6	8.1	56.4		
01	192 44.9		10.9		305 29.0	10.9	17 44.7	8.1	56.4		
02	207 45.1		10.0		319 58.9	10.9	17 52.8	7.9	56.4		
03	222 45.2	. .	09.0		334 28.8	10.9	18 00.7	7.9	56.3		
04	237 45.4		08.0		348 58.7	10.9	18 08.6	7.7	56.3		
05	252 45.6		07.0		3 28.6	10.9	18 16.3	7.6	56.3		
06	267 45.8	S	2 06.0		17 58.5	10.9	S18 23.9	7.6	56.2		
07	282 45.9		05.0		32 28.4	10.9	18 31.5	7.4	56.2		
08	297 46.1		04.0		46 58.3	10.9	18 38.9	7.4	56.2		
09	312 46.3	. .	03.0		61 28.2	10.8	18 46.3	7.2	56.1		
10	327 46.5		02.1		75 58.0	10.9	18 53.5	7.1	56.1		
11	342 46.6		01.1		90 27.9	10.9	19 00.6	7.0	56.1		
12	357 46.8	S	2 00.1		104 57.8	10.8	S19 07.6	7.0	56.0		
13	12 47.0		1 59.1		119 27.6	10.8	19 14.6	6.8	56.0		
14	27 47.2		58.1		133 57.4	10.9	19 21.4	6.7	56.0		
15	42 47.4	. .	57.1		148 27.3	10.8	19 28.1	6.6	55.9		
16	57 47.5		56.1		162 57.1	10.8	19 34.7	6.5	55.9		
17	72 47.7		55.1		177 26.9	10.8	19 41.2	6.4	55.9		
18	87 47.9	S	1 54.2		191 56.7	10.9	S19 47.6	6.3	55.8		
19	102 48.1		53.2		206 26.6	10.8	19 53.9	6.2	55.8		
20	117 48.2		52.2		220 56.4	10.8	20 00.1	6.1	55.8		
21	132 48.4	. .	51.2		235 26.2	10.8	20 06.2	5.9	55.8		
22	147 48.6		50.2		249 56.0	10.8	20 12.1	5.9	55.7		
23	162 48.8		49.2		264 25.8	10.7	20 18.0	5.7	55.7		
VIERNES 16 00	177 48.9	S	1 48.2		278 55.5	10.8	S20 23.7	5.7	55.7		
01	192 49.1		47.2		293 25.3	10.8	20 29.4	5.5	55.6		
02	207 49.3		46.3		307 55.1	10.8	20 34.9	5.5	55.6		
03	222 49.5	. .	45.3		322 24.9	10.7	20 40.4	5.3	55.6		
04	237 49.7		44.3		336 54.6	10.8	20 45.7	5.2	55.5		
05	252 49.8		43.3		351 24.4	10.8	20 50.9	5.1	55.5		
06	267 50.0	S	1 42.3		5 54.2	10.7	S20 56.0	5.0	55.5		
07	282 50.2		41.3		20 23.9	10.8	21 01.0	4.9	55.5		
08	297 50.4		40.3		34 53.7	10.8	21 05.9	4.8	55.4		
09	312 50.6	. .	39.3		49 23.5	10.7	21 10.7	4.6	55.4		
10	327 50.7		38.4		63 53.2	10.8	21 15.3	4.6	55.4		
11	342 50.9		37.4		78 23.0	10.7	21 19.9	4.4	55.4		
12	357 51.1	S	1 36.4		92 52.7	10.8	S21 24.3	4.4	55.3		
13	12 51.3		35.4		107 22.5	10.7	21 28.7	4.2	55.3		
14	27 51.4		34.4		121 52.2	10.8	21 32.9	4.1	55.3		
15	42 51.6	. .	33.4		136 22.0	10.7	21 37.0	4.0	55.2		
16	57 51.8		32.4		150 51.7	10.8	21 41.0	3.9	55.2		
17	72 52.0		31.4		165 21.5	10.7	21 44.9	3.8	55.2		
18	87 52.2	S	1 30.4		179 51.2	10.8	S21 48.7	3.7	55.2		
19	102 52.3		29.5		194 21.0	10.7	21 52.4	3.6	55.1		
20	117 52.5		28.5		208 50.7	10.8	21 56.0	3.4	55.1		
21	132 52.7	. .	27.5		223 20.5	10.7	21 59.4	3.4	55.1		
22	147 52.9		26.5		237 50.2	10.8	22 02.8	3.2	55.1		
23	162 53.1		25.5		252 20.0	10.8	S22 06.0	3.1	55.1		
	SD 16.1		d 1.0		SD 15.5		15.3		15.1		

Lat.	Crepúsculo Náutico	Crepúsculo Civil	Orto Sol	Orto Luna 14	Orto Luna 15	Orto Luna 16	Orto Luna 17
°	h m	h m	h m	h m	h m	h m	h m
N 72	03 53	05 17	06 24	01 16	▬	▬	▬
N 70	04 07	05 22	06 22	00 45	02 58	▬	▬
68	04 19	05 26	06 21	00 22	02 15	04 16	▬
66	04 28	05 29	06 20	00 05	01 47	03 26	04 56
64	04 35	05 31	06 19	25 25	01 25	02 54	04 13
62	04 41	05 34	06 18	25 08	01 08	02 31	03 44
60	04 47	05 35	06 17	24 54	00 54	02 12	03 22
N 58	04 51	05 37	06 16	24 41	00 41	01 57	03 04
56	04 55	05 38	06 15	24 31	00 31	01 44	02 49
54	04 58	05 40	06 15	24 22	00 22	01 33	02 36
52	05 01	05 41	06 14	24 13	00 13	01 22	02 25
50	05 04	05 42	06 14	24 06	00 06	01 13	02 15
45	05 09	05 43	06 13	23 50	24 55	00 55	01 54
N 40	05 13	05 45	06 12	23 38	24 39	00 39	01 37
35	05 16	05 46	06 11	23 27	24 26	00 26	01 22
30	05 18	05 46	06 10	23 17	24 15	00 15	01 10
20	05 21	05 46	06 08	23 01	23 56	24 49	00 49
N 10	05 22	05 46	06 07	22 47	23 39	24 31	00 31
0	05 21	05 45	06 06	22 34	23 24	24 14	00 14
S 10	05 19	05 43	06 04	22 21	23 08	23 57	24 46
20	05 15	05 40	06 02	22 07	22 52	23 38	24 27
30	05 08	05 36	06 00	21 51	22 33	23 17	24 05
35	05 04	05 34	05 59	21 42	22 22	23 05	23 53
40	04 59	05 30	05 58	21 31	22 09	22 51	23 38
45	04 52	05 26	05 56	21 19	21 54	22 35	23 21
S 50	04 43	05 21	05 54	21 04	21 36	22 14	22 59
52	04 38	05 19	05 53	20 58	21 28	22 05	22 49
54	04 33	05 16	05 52	20 50	21 19	21 54	22 37
56	04 28	05 13	05 50	20 42	21 08	21 42	22 24
58	04 21	05 10	05 49	20 32	20 56	21 27	22 09
S 60	04 14	05 06	05 48	20 21	20 42	21 11	21 51

Lat.	Ocaso Sol	Crepúsculo Civil	Crepúsculo Náutico	Ocaso Luna 14	Ocaso Luna 15	Ocaso Luna 16	Ocaso Luna 17
°	h m	h m	h m	h m	h m	h m	h m
N 72	17 56	19 04	20 29	06 17	▬	▬	▬
N 70	17 58	18 59	20 14	06 49	06 20	▬	▬
68	17 59	18 54	20 02	07 13	07 04	06 47	▬
66	18 00	18 51	19 53	07 32	07 33	07 38	07 52
64	18 01	18 48	19 45	07 47	07 55	08 10	08 35
62	18 02	18 46	19 39	08 00	08 13	08 33	09 04
60	18 02	18 44	19 33	08 11	08 28	08 52	09 26
N 58	18 03	18 42	19 28	08 20	08 41	09 08	09 45
56	18 03	18 41	19 24	08 28	08 52	09 22	10 00
54	18 04	18 39	19 21	08 36	09 02	09 33	10 13
52	18 04	18 38	19 18	08 42	09 10	09 44	10 24
50	18 05	18 37	19 15	08 48	09 18	09 53	10 34
45	18 06	18 35	19 09	09 01	09 35	10 13	10 56
N 40	18 07	18 34	19 05	09 12	09 48	10 28	11 13
35	18 08	18 33	19 02	09 22	10 00	10 42	11 27
30	18 08	18 32	19 00	09 30	10 10	10 54	11 40
20	18 10	18 32	18 57	09 44	10 28	11 14	12 02
N 10	18 11	18 32	18 56	09 56	10 43	11 31	12 20
0	18 12	18 33	18 57	10 08	10 58	11 48	12 38
S 10	18 14	18 35	18 59	10 19	11 12	12 04	12 55
20	18 15	18 37	19 03	10 32	11 27	12 22	13 14
30	18 17	18 41	19 09	10 46	11 45	12 42	13 35
35	18 18	18 43	19 13	10 55	11 56	12 54	13 48
40	18 20	18 47	19 18	11 04	12 07	13 07	14 02
45	18 21	18 50	19 25	11 15	12 22	13 23	14 20
S 50	18 23	18 55	19 34	11 29	12 39	13 43	14 41
52	18 24	18 58	19 38	11 35	12 47	13 53	14 51
54	18 25	19 00	19 43	11 42	12 56	14 03	15 03
56	18 26	19 03	19 48	11 50	13 06	14 16	15 16
58	18 27	19 07	19 54	11 59	13 18	14 30	15 31
S 60	18 29	19 11	20 02	12 09	13 31	14 46	15 49

Día	SOL E.T. (−) 00h	SOL E.T. (−) 12h	SOL Pas. Mer.	LUNA Pas. Mer. Sup.	LUNA Pas. Mer. Inf.	LUNA Edad	LUNA Fase
d	m s	m s	h m	h m	h m	d	%
14	09 18	09 10	12 09	03 56	16 21	19	73
15	09 02	08 53	12 09	04 46	17 11	20	63
16	08 45	08 36	12 09	05 36	18 01	21	54

(MAR., MIE., JUE.) 20, 21, 22 MARZO DEL 2001

T.U.	ARIES	VENUS −4.2		MARTE +0.1		JUPITER −2.2		SATURNO +0.2	
	A.H.G.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
20 00	177 35.5	166 47.4	N13 34.9	282 48.7	S22 07.6	113 45.5	N20 44.6	122 48.8	N17 36.1
01	192 37.9	181 50.9	34.5	297 50.0	07.7	128 47.6	44.7	137 51.0	36.2
02	207 40.4	196 54.5	34.2	312 51.3	07.9	143 49.6	44.8	152 53.3	36.2
03	222 42.9	211 58.0	33.9	327 52.7	08.0	158 51.7	44.9	167 55.5	36.3
04	237 45.3	227 01.6	33.6	342 54.0	08.2	173 53.8	44.9	182 57.7	36.4
05	252 47.8	242 05.1	33.3	357 55.3	08.4	188 55.8	45.0	198 00.0	36.4
06	267 50.2	257 08.7	N13 33.0	12 56.7	S22 08.5	203 57.9	N20 45.1	213 02.2	N17 36.5
07	282 52.7	272 12.2	32.6	27 58.0	08.7	219 00.0	45.2	228 04.4	36.5
08	297 55.2	287 15.8	32.3	42 59.3	08.8	234 02.0	45.2	243 06.7	36.6
M 09	312 57.6	302 19.4	32.0	58 00.7	09.0	249 04.1	45.3	258 08.9	36.7
A 10	328 00.1	317 22.9	31.6	73 02.0	09.1	264 06.1	45.4	273 11.2	36.7
R 11	343 02.6	332 26.5	31.3	88 03.3	09.3	279 08.2	45.5	288 13.4	36.8
T 12	358 05.0	347 30.1	N13 31.0	103 04.7	S22 09.5	294 10.3	N20 45.5	303 15.6	N17 36.8
13	13 07.5	2 33.6	30.6	118 06.0	09.6	309 12.3	45.6	318 17.9	36.9
E 14	28 10.0	17 37.2	30.3	133 07.4	09.8	324 14.4	45.7	333 20.1	37.0
15	43 12.4	32 40.8	29.9	148 08.7	09.9	339 16.4	45.8	348 22.4	37.0
S 16	58 14.9	47 44.4	29.6	163 10.0	10.1	354 18.5	45.8	3 24.6	37.1
17	73 17.4	62 48.0	29.2	178 11.4	10.2	9 20.6	45.9	18 26.8	37.1
18	88 19.8	77 51.6	N13 28.9	193 12.7	S22 10.4	24 22.6	N20 46.0	33 29.1	N17 37.2
19	103 22.3	92 55.1	28.5	208 14.0	10.5	39 24.7	46.1	48 31.3	37.3
20	118 24.7	107 58.7	28.2	223 15.4	10.7	54 26.7	46.1	63 33.5	37.3
21	133 27.2	123 02.3	27.8	238 16.7	10.9	69 28.8	46.2	78 35.8	37.4
22	148 29.7	138 05.9	27.5	253 18.1	11.0	84 30.9	46.3	93 38.0	37.4
23	163 32.1	153 09.5	27.1	268 19.4	11.2	99 32.9	46.4	108 40.2	37.5
21 00	178 34.6	168 13.1	N13 26.7	283 20.7	S22 11.3	114 35.0	N20 46.4	123 42.5	N17 37.6
01	193 37.1	183 16.7	26.3	298 22.1	11.5	129 37.0	46.5	138 44.7	37.6
02	208 39.5	198 20.4	26.0	313 23.4	11.6	144 39.1	46.6	153 47.0	37.7
03	223 42.0	213 24.0	25.6	328 24.8	11.8	159 41.1	46.7	168 49.2	37.7
04	238 44.5	228 27.6	25.2	343 26.1	11.9	174 43.2	46.7	183 51.4	37.8
05	253 46.9	243 31.2	24.8	358 27.5	12.1	189 45.3	46.8	198 53.7	37.9
06	268 49.4	258 34.8	N13 24.4	13 28.8	S22 12.2	204 47.3	N20 46.9	213 55.9	N17 37.9
M 07	283 51.8	273 38.4	24.1	28 30.1	12.4	219 49.4	47.0	228 58.1	38.0
I 08	298 54.3	288 42.1	23.7	43 31.5	12.6	234 51.4	47.0	244 00.4	38.0
09	313 56.8	303 45.7	23.3	58 32.8	12.7	249 53.5	47.1	259 02.6	38.1
E 10	328 59.2	318 49.3	22.9	73 34.2	12.9	264 55.5	47.2	274 04.8	38.2
R 11	344 01.7	333 52.9	22.5	88 35.5	13.0	279 57.6	47.3	289 07.1	38.2
C 12	359 04.2	348 56.6	N13 22.1	103 36.9	S22 13.2	294 59.7	N20 47.3	304 09.3	N17 38.3
O 13	14 06.6	4 00.2	21.7	118 38.2	13.3	310 01.7	47.4	319 11.5	38.4
L 14	29 09.1	19 03.9	21.3	133 39.6	13.5	325 03.8	47.5	334 13.8	38.4
E 15	44 11.6	34 07.5	20.9	148 40.9	13.6	340 05.8	47.6	349 16.0	38.5
S 16	59 14.0	49 11.1	20.5	163 42.3	13.8	355 07.9	47.6	4 18.2	38.5
17	74 16.5	64 14.8	20.0	178 43.6	13.9	10 09.9	47.7	19 20.5	38.6
18	89 19.0	79 18.4	N13 19.6	193 45.0	S22 14.1	25 12.0	N20 47.8	34 22.7	N17 38.7
19	104 21.4	94 22.1	19.2	208 46.3	14.2	40 14.0	47.9	49 24.9	38.7
20	119 23.9	109 25.7	18.8	223 47.7	14.4	55 16.1	47.9	64 27.2	38.8
21	134 26.3	124 29.4	18.4	238 49.0	14.5	70 18.1	48.0	79 29.4	38.8
22	149 28.8	139 33.0	17.9	253 50.4	14.7	85 20.2	48.1	94 31.6	38.9
23	164 31.3	154 36.7	17.5	268 51.7	14.8	100 22.2	48.2	109 33.9	39.0
22 00	179 33.7	169 40.4	N13 17.1	283 53.1	S22 15.0	115 24.3	N20 48.2	124 36.1	N17 39.0
01	194 36.2	184 44.0	16.6	298 54.4	15.1	130 26.3	48.3	139 38.3	39.1
02	209 38.7	199 47.7	16.2	313 55.8	15.3	145 28.4	48.4	154 40.6	39.1
03	224 41.1	214 51.4	15.8	328 57.1	15.5	160 30.5	48.5	169 42.8	39.2
04	239 43.6	229 55.0	15.3	343 58.5	15.6	175 32.5	48.6	184 45.0	39.3
05	254 46.1	244 58.7	14.9	358 59.8	15.8	190 34.6	48.6	199 47.3	39.3
06	269 48.5	260 02.4	N13 14.4	14 01.2	S22 15.9	205 36.6	N20 48.7	214 49.5	N17 39.4
07	284 51.0	275 06.1	14.0	29 02.6	16.1	220 38.7	48.8	229 51.7	39.4
J 08	299 53.4	290 09.7	13.5	44 03.9	16.2	235 40.7	48.9	244 54.0	39.5
U 09	314 55.9	305 13.4	13.1	59 05.3	16.4	250 42.8	48.9	259 56.2	39.6
E 10	329 58.4	320 17.1	12.6	74 06.6	16.5	265 44.8	49.0	274 58.4	39.6
V 11	345 00.8	335 20.8	12.2	89 08.0	16.7	280 46.9	49.1	290 00.7	39.7
E 12	0 03.3	350 24.5	N13 11.7	104 09.3	S22 16.8	295 48.9	N20 49.2	305 02.9	N17 39.8
S 13	15 05.8	5 28.2	11.2	119 10.7	17.0	310 51.0	49.2	320 05.1	39.8
14	30 08.2	20 31.8	10.8	134 12.1	17.1	325 53.0	49.3	335 07.3	39.9
15	45 10.7	35 35.5	10.3	149 13.4	17.3	340 55.1	49.4	350 09.6	39.9
16	60 13.2	50 39.2	09.8	164 14.8	17.4	355 57.1	49.5	5 11.8	40.0
17	75 15.6	65 42.9	09.4	179 16.1	17.6	10 59.2	49.5	20 14.0	40.1
18	90 18.1	80 46.6	N13 08.9	194 17.5	S22 17.7	26 01.2	N20 49.6	35 16.3	N17 40.1
19	105 20.6	95 50.3	08.4	209 18.9	17.9	41 03.3	49.7	50 18.5	40.2
20	120 23.0	110 54.0	07.9	224 20.2	18.0	56 05.3	49.8	65 20.7	40.2
21	135 25.5	125 57.7	07.4	239 21.6	18.2	71 07.3	49.8	80 23.0	40.3
22	150 27.9	141 01.4	06.9	254 23.0	18.3	86 09.4	49.9	95 25.2	40.4
23	165 30.4	156 05.2	06.5	269 24.3	18.4	101 11.4	50.0	110 27.4	40.4
	h m								
Pas. Mer.	12 03.7	v 3.6	d 0.4	v 1.3	d 0.2	v 2.1	d 0.1	v 2.2	d 0.1

ESTRELLAS

Nombre	A.H.S.	Dec.
	° ′	° ′
Acamar	315 25.9	S40 18.3
Achernar	335 34.3	S57 14.1
Acrux	173 19.5	S63 06.3
Adhara	255 20.0	S28 58.7
Aldebaran	291 00.5	N16 30.6
Alioth	166 28.5	N55 57.2
Alkaid	153 06.0	N49 18.3
Al Na'ir	27 56.1	S46 57.4
Alnilam	275 56.2	S 1 12.2
Alphard	218 05.3	S 8 39.9
Alphecca	126 18.9	N26 42.5
Alpheratz	357 53.8	N29 05.6
Altair	62 17.7	N 8 52.1
Ankaa	353 25.5	S42 18.2
Antares	112 37.9	S26 26.0
Arcturus	146 04.2	N19 10.5
Atria	107 48.3	S69 01.5
Avior	234 21.6	S59 31.1
Bellatrix	278 42.4	N 6 20.9
Betelgeuse	271 11.7	N 7 24.3
Canopus	264 00.4	S52 42.1
Capella	280 48.8	N46 00.0
Deneb	49 38.3	N45 16.8
Denebola	182 43.1	N14 33.9
Diphda	349 05.8	S17 59.1
Dubhe	194 02.7	N61 44.8
Elnath	278 24.8	N28 36.5
Eltanin	90 50.6	N51 29.0
Enif	33 56.8	N 9 52.6
Fomalhaut	15 34.9	S29 37.1
Gacrux	172 11.2	S57 07.1
Gienah	176 01.9	S17 32.9
Hadar	149 01.1	S60 22.6
Hamal	328 11.9	N23 27.9
Kaus Aust.	83 56.6	S34 23.0
Kochab	137 18.6	N74 08.9
Markab	13 48.2	N15 12.5
Menkar	314 25.3	N 4 05.5
Menkent	148 18.6	S36 22.5
Miaplacidus	221 41.2	S69 43.5
Mirfak	308 54.5	N49 51.9
Nunki	76 10.3	S26 17.7
Peacock	53 34.6	S56 43.8
Pollux	243 39.3	N28 01.4
Procyon	245 09.7	N 5 13.2
Rasalhague	96 15.3	N12 33.4
Regulus	207 53.4	N11 57.7
Rigel	281 21.4	S 8 12.2
Rigil Kent.	140 04.5	S60 50.2
Sabik	102 23.5	S15 43.6
Schedar	349 52.2	N56 32.5
Shaula	96 34.9	S37 06.2
Sirius	258 42.2	S16 43.3
Spica	158 41.1	S11 10.1
Suhail	222 59.2	S43 26.4
Vega	80 45.5	N38 46.8
Zuben'ubi	137 15.8	S16 02.8

	A.H.S.	Pas. Mer.
	° ′	h m
Venus	349 38.5	12 44
Marte	104 46.1	5 06
Júpiter	296 00.4	16 19
Saturno	305 07.9	15 43

T.U.	SOL				LUNA					
	A.H.G.		Dec.		A.H.G.	v	Dec.	d	P.H.	
d h	° ′		° ′		° ′	′	° ′	′	′	
20 00	178 06.3	S	0 13.4		231 11.5	12.2	S21 07.3	4.6	54.1	
01	193 06.5		12.4		245 42.7	12.3	21 02.7	4.8	54.1	
02	208 06.7		11.4		260 14.0	12.3	20 57.9	4.8	54.1	
03	223 06.9	. .	10.4		274 45.3	12.3	20 53.1	4.9	54.1	
04	238 07.1		09.4		289 16.6	12.3	20 48.2	5.1	54.1	
05	253 07.3		08.4		303 47.9	12.4	20 43.1	5.1	54.1	
06	268 07.5	S	0 07.4		318 19.3	12.4	S20 38.0	5.2	54.1	
07	283 07.6		06.4		332 50.7	12.5	20 32.8	5.3	54.1	
M 08	298 07.8		05.5		347 22.2	12.5	20 27.5	5.4	54.1	
09	313 08.0	. .	04.5		1 53.7	12.5	20 22.1	5.4	54.1	
A 10	328 08.2		03.5		16 25.2	12.6	20 16.7	5.6	54.1	
R 11	343 08.4		02.5		30 56.8	12.6	20 11.1	5.7	54.1	
T 12	358 08.6	S	0 01.5		45 28.4	12.6	S20 05.4	5.7	54.1	
E 13	13 08.7	S	00.5		60 00.0	12.7	19 59.7	5.9	54.1	
14	28 08.9	N	00.5		74 31.7	12.7	19 53.8	5.9	54.1	
S 15	43 09.1	. .	01.5		89 03.4	12.7	19 47.9	6.0	54.1	
16	58 09.3		02.5		103 35.1	12.8	19 41.9	6.1	54.1	
17	73 09.5		03.4		118 06.9	12.8	19 35.8	6.2	54.1	
18	88 09.7	N	0 04.4		132 38.7	12.8	S19 29.6	6.3	54.1	
19	103 09.9		05.4		147 10.5	12.9	19 23.3	6.4	54.1	
20	118 10.0		06.4		161 42.4	12.9	19 16.9	6.5	54.1	
21	133 10.2	. .	07.4		176 14.3	12.9	19 10.4	6.5	54.1	
22	148 10.4		08.4		190 46.2	13.0	19 03.9	6.6	54.1	
23	163 10.6		09.4		205 18.2	13.0	18 57.3	6.7	54.1	
21 00	178 10.8	N	0 10.4		219 50.2	13.0	S18 50.6	6.8	54.1	
01	193 11.0		11.3		234 22.2	13.1	18 43.8	6.9	54.1	
02	208 11.2		12.3		248 54.3	13.1	18 36.9	7.0	54.1	
03	223 11.3	. .	13.3		263 26.4	13.2	18 29.9	7.0	54.1	
04	238 11.5		14.3		277 58.6	13.2	18 22.9	7.2	54.1	
05	253 11.7		15.3		292 30.8	13.2	18 15.7	7.2	54.1	
06	268 11.9	N	0 16.3		307 03.0	13.2	S18 08.5	7.3	54.1	
M 07	283 12.1		17.3		321 35.2	13.3	18 01.2	7.3	54.1	
I 08	298 12.3		18.3		336 07.5	13.4	17 53.9	7.5	54.1	
E 09	313 12.5	. .	19.2		350 39.9	13.3	17 46.4	7.5	54.1	
R 10	328 12.6		20.2		5 12.2	13.4	17 38.9	7.6	54.1	
C 11	343 12.8		21.2		19 44.6	13.4	17 31.3	7.7	54.1	
O 12	358 13.0	N	0 22.2		34 17.0	13.5	S17 23.6	7.8	54.1	
L 13	13 13.2		23.2		48 49.5	13.5	17 15.8	7.8	54.2	
E 14	28 13.4		24.2		63 22.0	13.5	17 08.0	7.9	54.2	
S 15	43 13.6	. .	25.2		77 54.5	13.6	17 00.1	8.0	54.2	
16	58 13.8		26.2		92 27.1	13.5	16 52.1	8.1	54.2	
17	73 13.9		27.1		106 59.6	13.7	16 44.0	8.1	54.2	
18	88 14.1	N	0 28.1		121 32.3	13.6	S16 35.9	8.2	54.2	
19	103 14.3		29.1		136 04.9	13.7	16 27.7	8.3	54.2	
20	118 14.5		30.1		150 37.6	13.7	16 19.4	8.4	54.2	
21	133 14.7	. .	31.1		165 10.3	13.8	16 11.0	8.4	54.2	
22	148 14.9		32.1		179 43.1	13.7	16 02.6	8.5	54.2	
23	163 15.1		33.1		194 15.8	13.9	15 54.1	8.6	54.2	
22 00	178 15.3	N	0 34.1		208 48.7	13.8	S15 45.5	8.7	54.2	
01	193 15.4		35.0		223 21.5	13.9	15 36.8	8.7	54.2	
02	208 15.6		36.0		237 54.4	13.9	15 28.1	8.8	54.2	
03	223 15.8	. .	37.0		252 27.3	13.9	15 19.3	8.8	54.3	
04	238 16.0		38.0		267 00.2	14.0	15 10.5	8.9	54.3	
05	253 16.2		39.0		281 33.2	14.0	15 01.6	9.0	54.3	
06	268 16.4	N	0 40.0		296 06.2	14.0	S14 52.6	9.1	54.3	
07	283 16.6		41.0		310 39.2	14.0	14 43.5	9.1	54.3	
J 08	298 16.7		42.0		325 12.2	14.1	14 34.4	9.2	54.3	
U 09	313 16.9	. .	42.9		339 45.3	14.1	14 25.2	9.2	54.3	
E 10	328 17.1		43.9		354 18.4	14.2	14 16.0	9.4	54.3	
V 11	343 17.3		44.9		8 51.6	14.1	14 06.6	9.3	54.3	
E 12	358 17.5	N	0 45.9		23 24.7	14.2	S13 57.3	9.5	54.3	
S 13	13 17.7		46.9		37 57.9	14.2	13 47.8	9.5	54.4	
14	28 17.9		47.9		52 31.1	14.3	13 38.3	9.6	54.4	
15	43 18.1	. .	48.9		67 04.4	14.2	13 28.7	9.6	54.4	
16	58 18.2		49.8		81 37.6	14.3	13 19.1	9.7	54.4	
17	73 18.4		50.8		96 10.9	14.3	13 09.4	9.7	54.4	
18	88 18.6	N	0 51.8		110 44.2	14.4	S12 59.7	9.8	54.4	
19	103 18.8		52.8		125 17.6	14.3	12 49.9	9.9	54.4	
20	118 19.0		53.8		139 50.9	14.4	12 40.0	9.9	54.4	
21	133 19.2	. .	54.8		154 24.3	14.4	12 30.1	10.0	54.4	
22	148 19.4		55.8		168 57.7	14.5	12 20.1	10.0	54.4	
23	163 19.5		56.7		183 31.2	14.4	S12 10.1	10.1	54.5	
	SD 16.1		d 1.0		SD 14.7		14.8		14.8	

Lat.	Crepúsculo Náutico	Crepúsculo Civil	Orto Sol	Orto Luna 20	Orto Luna 21	Orto Luna 22	Orto Luna 23
°	h m	h m	h m	h m	h m	h m	h m
N 72	03 14	04 45	05 53	▬	09 07	07 54	07 25
N 70	03 34	04 53	05 54	▬	07 48	07 24	07 08
68	03 50	05 00	05 56	07 23	07 10	07 01	06 54
66	04 02	05 05	05 57	06 40	06 43	06 43	06 43
64	04 12	05 10	05 57	06 10	06 22	06 29	06 33
62	04 20	05 14	05 58	05 48	06 05	06 17	06 25
60	04 27	05 17	05 59	05 30	05 51	06 06	06 18
N 58	04 33	05 20	05 59	05 15	05 39	05 57	06 11
56	04 38	05 23	06 00	05 02	05 28	05 49	06 06
54	04 43	05 25	06 00	04 51	05 19	05 42	06 01
52	04 47	05 27	06 00	04 41	05 11	05 35	05 56
50	04 50	05 29	06 01	04 32	05 03	05 30	05 52
45	04 58	05 32	06 01	04 13	04 47	05 17	05 43
N 40	05 03	05 35	06 02	03 58	04 34	05 06	05 36
35	05 08	05 37	06 02	03 45	04 23	04 58	05 29
30	05 11	05 39	06 03	03 33	04 13	04 50	05 24
20	05 16	05 41	06 03	03 14	03 56	04 36	05 14
N 10	05 18	05 43	06 04	02 57	03 41	04 24	05 05
0	05 19	05 43	06 04	02 41	03 27	04 13	04 57
S 10	05 19	05 43	06 04	02 25	03 14	04 01	04 49
20	05 16	05 42	06 04	02 08	02 59	03 49	04 40
30	05 12	05 40	06 04	01 48	02 41	03 36	04 30
35	05 09	05 39	06 04	01 36	02 31	03 27	04 24
40	05 05	05 37	06 04	01 23	02 20	03 18	04 17
45	05 00	05 34	06 04	01 08	02 06	03 07	04 10
S 50	04 53	05 31	06 03	00 48	01 50	02 54	04 00
52	04 50	05 29	06 03	00 39	01 42	02 48	03 56
54	04 46	05 28	06 03	00 29	01 33	02 41	03 51
56	04 42	05 26	06 03	00 17	01 24	02 34	03 46
58	04 37	05 23	06 03	00 04	01 13	02 25	03 40
S 60	04 31	05 21	06 02	25 00	01 00	02 15	03 33

Lat.	Ocaso Sol	Crepúsculo Civil	Crepúsculo Náutico	Ocaso Luna 20	Ocaso Luna 21	Ocaso Luna 22	Ocaso Luna 23
°	h m	h m	h m	h m	h m	h m	h m
N 72	18 24	19 33	21 05	▬	10 24	13 11	15 11
N 70	18 22	19 24	20 44	▬	11 42	13 40	15 27
68	18 21	19 17	20 28	10 29	12 19	14 01	15 39
66	18 20	19 11	20 15	11 13	12 45	14 18	15 49
64	18 19	19 06	20 05	11 41	13 06	14 31	15 57
62	18 18	19 02	19 56	12 03	13 22	14 43	16 04
60	18 17	18 59	19 49	12 21	13 35	14 52	16 10
N 58	18 16	18 56	19 43	12 36	13 47	15 01	16 16
56	18 16	18 53	19 38	12 48	13 57	15 08	16 21
54	18 15	18 51	19 33	12 59	14 06	15 15	16 25
52	18 15	18 49	19 29	13 09	14 13	15 21	16 29
50	18 15	18 47	19 25	13 17	14 21	15 26	16 32
45	18 14	18 43	19 18	13 35	14 36	15 37	16 40
N 40	18 13	18 40	19 12	13 50	14 48	15 47	16 46
35	18 12	18 38	19 07	14 03	14 58	15 55	16 51
30	18 12	18 36	19 04	14 14	15 08	16 02	16 56
20	18 11	18 33	18 59	14 32	15 23	16 14	17 04
N 10	18 11	18 32	18 56	14 48	15 37	16 24	17 11
0	18 10	18 31	18 55	15 04	15 49	16 34	17 18
S 10	18 10	18 31	18 55	15 19	16 02	16 44	17 24
20	18 10	18 32	18 57	15 34	16 16	16 54	17 31
30	18 10	18 34	19 01	15 53	16 31	17 06	17 39
35	18 10	18 35	19 04	16 03	16 40	17 13	17 43
40	18 10	18 37	19 08	16 15	16 50	17 20	17 49
45	18 10	18 39	19 13	16 30	17 01	17 29	17 54
S 50	18 10	18 42	19 20	16 47	17 16	17 40	18 01
52	18 10	18 44	19 23	16 55	17 22	17 45	18 05
54	18 10	18 45	19 27	17 04	17 30	17 50	18 08
56	18 10	18 47	19 31	17 14	17 38	17 56	18 12
58	18 10	18 49	19 36	17 26	17 47	18 03	18 16
S 60	18 10	18 52	19 42	17 39	17 57	18 11	18 21

Día	SOL E.T. (—) 00h	SOL E.T. (—) 12h	SOL Pas. Mer.	LUNA Pas. Mer. Sup.	LUNA Pas. Mer. Inf.	LUNA Edad	LUNA Fase
d	m s	m s	h m	h m	h m	d	%
20	07 35	07 26	12 07	08 52	21 16	25	18
21	07 17	07 08	12 07	09 39	22 01	26	12
22	06 59	06 50	12 07	10 23	22 45	27	6

(VIE., SAB., DOM.) 23, 24, 25 MAYO DEL 2001

T.U.	ARIES	VENUS −4.2		MARTE +0.0		JUPITER −2.1		SATURNO +0.2		ESTRELLAS		
	A.H.G.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.	Nombre	A.H.S.	Dec.
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′		° ′	° ′
23 00	180 32.9	171 08.9	N13 06.0	284 25.7	S22 18.6	116 13.5	N20 50.1	125 29.6	N17 40.5	Acamar	315 25.9	S40 18.3
01	195 35.3	186 12.6	05.5	299 27.0	18.7	131 15.5	50.1	140 31.9	40.6	Achernar	335 34.4	S57 14.1
02	210 37.8	201 16.3	05.0	314 28.4	18.9	146 17.6	50.2	155 34.1	40.6	Acrux	173 19.5	S63 06.3
03	225 40.3	216 20.0	. . 04.5	329 29.8	. . 19.0	161 19.6	. . 50.3	170 36.3	. . 40.7	Adhara	255 20.0	S28 58.7
04	240 42.7	231 23.7	04.0	344 31.1	19.2	176 21.7	50.4	185 38.6	40.7	Aldebaran	291 00.6	N16 30.6
05	255 45.2	246 27.4	03.5	359 32.5	19.3	191 23.7	50.4	200 40.8	40.8			
06	270 47.7	261 31.2	N13 03.0	14 33.9	S22 19.5	206 25.8	N20 50.5	215 43.0	N17 40.9	Alioth	166 28.5	N55 57.2
07	285 50.1	276 34.9	02.4	29 35.2	19.6	221 27.8	50.6	230 45.3	40.9	Alkaid	153 05.9	N49 18.4
08	300 52.6	291 38.6	01.9	44 36.6	19.8	236 29.9	50.7	245 47.5	41.0	Al Na'ir	27 56.1	S46 57.4
V 09	315 55.1	306 42.3	. . 01.4	59 38.0	. . 19.9	251 31.9	. . 50.7	260 49.7	. . 41.0	Alnilam	275 56.2	S 1 12.2
I 10	330 57.5	321 46.1	00.9	74 39.3	20.1	266 34.0	50.8	275 51.9	41.1	Alphard	218 05.3	S 8 39.9
E 11	346 00.0	336 49.8	13 00.4	89 40.7	20.2	281 36.0	50.9	290 54.2	41.2			
R 12	1 02.4	351 53.5	N12 59.9	104 42.1	S22 20.4	296 38.0	N20 51.0	305 56.4	N17 41.2	Alphecca	126 18.9	N26 42.5
N 13	16 04.9	6 57.3	59.3	119 43.5	20.5	311 40.1	51.1	320 58.6	41.3	Alpheratz	357 53.8	N29 05.6
E 14	31 07.4	22 01.0	58.8	134 44.8	20.7	326 42.1	51.1	336 00.8	41.4	Altair	62 17.7	N 8 52.1
S 15	46 09.8	37 04.8	. . 58.3	149 46.2	. . 20.8	341 44.2	. . 51.2	351 03.1	. . 41.4	Ankaa	353 25.5	S42 18.2
16	61 12.3	52 08.5	57.8	164 47.6	21.0	356 46.2	51.3	6 05.3	41.5	Antares	112 37.9	S26 26.0
17	76 14.8	67 12.2	57.2	179 48.9	21.1	11 48.3	51.4	21 07.5	41.5			
18	91 17.2	82 16.0	N12 56.7	194 50.3	S22 21.2	26 50.3	N20 51.4	36 09.8	N17 41.6	Arcturus	146 04.2	N19 10.5
19	106 19.7	97 19.7	56.1	209 51.7	21.4	41 52.3	51.5	51 12.0	41.7	Atria	107 48.3	S69 01.5
20	121 22.2	112 23.5	55.6	224 53.1	21.5	56 54.4	51.6	66 14.2	41.7	Avior	234 21.7	S59 31.1
21	136 24.6	127 27.2	. . 55.1	239 54.4	. . 21.7	71 56.4	. . 51.7	81 16.4	. . 41.8	Bellatrix	278 42.4	N 6 20.9
22	151 27.1	142 31.0	54.5	254 55.8	21.8	86 58.5	51.7	96 18.7	41.8	Betelgeuse	271 11.7	N 7 24.3
23	166 29.5	157 34.7	54.0	269 57.2	22.0	102 00.5	51.8	111 20.9	41.9			
24 00	181 32.0	172 38.5	N12 53.4	284 58.6	S22 22.1	117 02.6	N20 51.9	126 23.1	N17 42.0	Canopus	264 00.4	S52 42.1
01	196 34.5	187 42.2	52.9	299 59.9	22.3	132 04.6	52.0	141 25.3	42.0	Capella	280 48.8	N46 00.0
02	211 36.9	202 46.0	52.3	315 01.3	22.4	147 06.6	52.0	156 27.6	42.1	Deneb	49 38.3	N45 16.8
03	226 39.4	217 49.7	. . 51.7	330 02.7	. . 22.6	162 08.7	. . 52.1	171 29.8	. . 42.2	Denebola	182 43.1	N14 33.9
04	241 41.9	232 53.5	51.2	345 04.1	22.7	177 10.7	52.2	186 32.0	42.2	Diphda	349 05.8	S17 59.1
05	256 44.3	247 57.3	50.6	0 05.5	22.8	192 12.8	52.3	201 34.2	42.3			
06	271 46.8	263 01.0	N12 50.1	15 06.8	S22 23.0	207 14.8	N20 52.3	216 36.5	N17 42.3	Dubhe	194 02.7	N61 44.8
07	286 49.3	278 04.8	49.5	30 08.2	23.1	222 16.8	52.4	231 38.7	42.4	Elnath	278 24.8	N28 36.5
S 08	301 51.7	293 08.6	48.9	45 09.6	23.3	237 18.9	52.5	246 40.9	42.5	Eltanin	90 50.6	N51 29.0
A 09	316 54.2	308 12.3	. . 48.3	60 11.0	. . 23.4	252 20.9	. . 52.6	261 43.2	. . 42.5	Enif	33 56.8	N 9 52.6
B 10	331 56.7	323 16.1	47.8	75 12.4	23.6	267 23.0	52.7	276 45.4	42.6	Fomalhaut	15 34.9	S29 37.1
A 11	346 59.1	338 19.9	47.2	90 13.7	23.7	282 25.0	52.7	291 47.6	42.7			
A 12	2 01.6	353 23.6	N12 46.6	105 15.1	S22 23.9	297 27.0	N20 52.8	306 49.8	N17 42.7	Gacrux	172 11.2	S57 07.1
13	17 04.0	8 27.4	46.0	120 16.5	24.0	312 29.1	52.9	321 52.1	42.8	Gienah	176 01.9	S17 32.9
D 14	32 06.5	23 31.2	45.5	135 17.9	24.1	327 31.1	53.0	336 54.3	42.8	Hadar	149 01.1	S60 22.6
15	47 09.0	38 34.9	. . 44.9	150 19.3	. . 24.3	342 33.2	. . 53.0	351 56.5	. . 42.9	Hamal	328 11.9	N23 27.9
O 16	62 11.4	53 38.7	44.3	165 20.7	24.4	357 35.2	53.1	6 58.7	43.0	Kaus Aust.	83 56.6	S34 23.0
17	77 13.9	68 42.5	43.7	180 22.0	24.6	12 37.2	53.2	22 00.9	43.0			
18	92 16.4	83 46.3	N12 43.1	195 23.4	S22 24.7	27 39.3	N20 53.3	37 03.2	N17 43.1	Kochab	137 18.6	N74 08.9
19	107 18.8	98 50.1	42.5	210 24.8	24.9	42 41.3	53.3	52 05.4	43.1	Markab	13 48.2	N15 12.5
20	122 21.3	113 53.8	41.9	225 26.2	25.0	57 43.3	53.4	67 07.6	43.2	Menkar	314 25.3	N 4 05.5
21	137 23.8	128 57.6	. . 41.3	240 27.6	. . 25.1	72 45.4	. . 53.5	82 09.8	. . 43.3	Menkent	148 18.6	S36 22.5
22	152 26.2	144 01.4	40.7	255 29.0	25.3	87 47.4	53.6	97 12.1	43.3	Miaplacidus	221 41.2	S69 43.5
23	167 28.7	159 05.2	40.1	270 30.4	25.4	102 49.5	53.6	112 14.3	43.4			
25 00	182 31.1	174 09.0	N12 39.5	285 31.7	S22 25.6	117 51.5	N20 53.7	127 16.5	N17 43.5	Mirfak	308 54.5	N49 51.9
01	197 33.6	189 12.8	38.9	300 33.1	25.7	132 53.5	53.8	142 18.7	43.5	Nunki	76 10.3	S26 17.7
02	212 36.1	204 16.6	38.3	315 34.5	25.9	147 55.6	53.9	157 21.0	43.6	Peacock	53 34.6	S56 43.8
03	227 38.5	219 20.4	. . 37.6	330 35.9	. . 26.0	162 57.6	. . 54.0	172 23.2	. . 43.6	Pollux	243 39.3	N28 01.4
04	242 41.0	234 24.1	37.0	345 37.3	26.1	177 59.6	54.0	187 25.4	43.7	Procyon	245 09.7	N 5 13.2
05	257 43.5	249 27.9	36.4	0 38.7	26.3	193 01.7	54.1	202 27.6	43.8			
06	272 45.9	264 31.7	N12 35.8	15 40.1	S22 26.4	208 03.7	N20 54.2	217 29.9	N17 43.8	Rasalhague	96 15.3	N12 33.4
07	287 48.4	279 35.5	35.2	30 41.5	26.6	223 05.7	54.3	232 32.1	43.9	Regulus	207 53.4	N11 57.7
08	302 50.9	294 39.3	34.5	45 42.9	26.7	238 07.8	54.3	247 34.3	44.0	Rigel	281 21.4	S 8 12.2
D 09	317 53.3	309 43.1	. . 33.9	60 44.3	. . 26.9	253 09.8	. . 54.4	262 36.5	. . 44.0	Rigil Kent.	140 04.5	S60 50.2
O 10	332 55.8	324 46.9	33.3	75 45.7	27.0	268 11.9	54.5	277 38.7	44.1	Sabik	102 23.5	S15 43.6
M 11	347 58.3	339 50.7	32.6	90 47.0	27.1	283 13.9	54.6	292 41.0	44.1			
I 12	3 00.7	354 54.5	N12 32.0	105 48.4	S22 27.3	298 15.9	N20 54.6	307 43.2	N17 44.2	Schedar	349 52.2	N56 32.5
N 13	18 03.2	9 58.3	31.4	120 49.8	27.4	313 18.0	54.7	322 45.4	44.3	Shaula	96 34.9	S37 06.2
G 14	33 05.6	25 02.1	30.7	135 51.2	27.6	328 20.0	54.8	337 47.6	44.3	Sirius	258 42.2	S16 43.3
O 15	48 08.1	40 05.9	. . 30.1	150 52.6	. . 27.7	343 22.0	. . 54.9	352 49.9	. . 44.4	Spica	158 41.1	S11 10.1
16	63 10.6	55 09.7	29.5	165 54.0	27.8	358 24.1	54.9	7 52.1	44.5	Suhail	222 59.3	S43 26.4
17	78 13.0	70 13.5	28.8	180 55.4	28.0	13 26.1	55.0	22 54.3	44.5			
18	93 15.5	85 17.4	N12 28.2	195 56.8	S22 28.1	28 28.1	N20 55.1	37 56.5	N17 44.6	Vega	80 45.5	N38 46.8
19	108 18.0	100 21.2	27.5	210 58.2	28.3	43 30.2	55.2	52 58.7	44.6	Zuben'ubi	137 15.8	S16 02.8
20	123 20.4	115 25.0	26.9	225 59.6	28.4	58 32.2	55.3	68 01.0	44.7		A.H.S.	Pas. Mer.
21	138 22.9	130 28.8	. . 26.2	241 01.0	. . 28.5	73 34.2	. . 55.3	83 03.2	. . 44.8		° ′	h m
22	153 25.4	145 32.6	25.5	256 02.4	28.7	88 36.2	55.4	98 05.4	44.8	Venus	351 06.5	12 26
23	168 27.8	160 36.4	24.9	271 03.8	28.8	103 38.3	55.5	113 07.6	44.9	Marte	103 26.6	5 00
	h m									Jupiter	295 30.5	16 10
Pas. Mer.	11 51.9	v 3.8	d 0.6	v 1.4	d 0.1	v 2.0	d 0.1	v 2.2	d 0.1	Saturno	304 51.1	15 32

T.U.	SOL				LUNA					
	A.H.G.		Dec.		A.H.G.	v	Dec.	d	P.H.	
d h	° ′		° ′		° ′	′	° ′	′	′	
23 00	178 19.7	N	0 57.7		198 04.6	14.5	S12 00.0	10.2	54.5	
01	193 19.9		58.7		212 38.1	14.5	11 49.8	10.2	54.5	
02	208 20.1		0 59.7		227 11.6	14.5	11 39.6	10.3	54.5	
03	223 20.3		1 00.7		241 45.1	14.6	11 29.3	10.3	54.5	
04	238 20.5		01.7		256 18.7	14.5	11 19.0	10.3	54.5	
05	253 20.7		02.7		270 52.2	14.6	11 08.7	10.4	54.5	
06	268 20.9	N	1 03.6		285 25.8	14.6	S10 58.3	10.5	54.5	
07	283 21.0		04.6		299 59.4	14.6	10 47.8	10.5	54.6	
08	298 21.2		05.6		314 33.0	14.6	10 37.3	10.6	54.6	
V 09	313 21.4	. .	06.6		329 06.6	14.7	10 26.7	10.6	54.6	
I 10	328 21.6		07.6		343 40.3	14.7	10 16.1	10.7	54.6	
E 11	343 21.8		08.6		358 14.0	14.7	10 05.4	10.7	54.6	
R 12	358 22.0	N	1 09.6		12 47.7	14.7	S 9 54.7	10.8	54.6	
N 13	13 22.2		10.5		27 21.4	14.7	9 43.9	10.8	54.6	
E 14	28 22.4		11.5		41 55.1	14.7	9 33.1	10.8	54.7	
S 15	43 22.5	. .	12.5		56 28.8	14.7	9 22.3	10.9	54.7	
16	58 22.7		13.5		71 02.5	14.8	9 11.4	11.0	54.7	
17	73 22.9		14.5		85 36.3	14.8	9 00.4	11.0	54.7	
18	88 23.1	N	1 15.5		100 10.1	14.7	S 8 49.4	11.0	54.7	
19	103 23.3		16.5		114 43.8	14.8	8 38.4	11.1	54.7	
20	118 23.5		17.4		129 17.6	14.8	8 27.3	11.1	54.7	
21	133 23.7	. .	18.4		143 51.4	14.9	8 16.2	11.1	54.8	
22	148 23.9		19.4		158 25.3	14.8	8 05.1	11.2	54.8	
23	163 24.0		20.4		172 59.1	14.8	7 53.9	11.3	54.8	
24 00	178 24.2	N	1 21.4		187 32.9	14.9	S 7 42.6	11.2	54.8	
01	193 24.4		22.4		202 06.8	14.8	7 31.4	11.3	54.8	
02	208 24.6		23.4		216 40.6	14.9	7 20.1	11.4	54.8	
03	223 24.8	. .	24.3		231 14.5	14.8	7 08.7	11.4	54.8	
04	238 25.0		25.3		245 48.3	14.9	6 57.3	11.4	54.9	
05	253 25.2		26.3		260 22.2	14.9	6 45.9	11.4	54.9	
06	268 25.4	N	1 27.3		274 56.1	14.9	S 6 34.5	11.5	54.9	
07	283 25.6		28.3		289 30.0	14.9	6 23.0	11.6	54.9	
S 08	298 25.7		29.3		304 03.9	14.8	6 11.4	11.5	54.9	
A 09	313 25.9	. .	30.2		318 37.7	14.9	5 59.9	11.6	54.9	
B 10	328 26.1		31.2		333 11.6	14.9	5 48.3	11.6	55.0	
A 11	343 26.3		32.2		347 45.5	14.9	5 36.7	11.7	55.0	
12	358 26.5	N	1 33.2		2 19.4	14.9	S 5 25.0	11.7	55.0	
D 13	13 26.7		34.2		16 53.3	14.9	5 13.3	11.7	55.0	
O 14	28 26.9		35.2		31 27.2	14.9	5 01.6	11.7	55.0	
15	43 27.1	. .	36.1		46 01.1	14.9	4 49.9	11.8	55.0	
16	58 27.2		37.1		60 35.0	14.9	4 38.1	11.8	55.1	
17	73 27.4		38.1		75 08.9	14.9	4 26.3	11.8	55.1	
18	88 27.6	N	1 39.1		89 42.8	14.9	S 4 14.5	11.8	55.1	
19	103 27.8		40.1		104 16.7	14.9	4 02.7	11.9	55.1	
20	118 28.0		41.1		118 50.6	14.9	3 50.8	11.9	55.1	
21	133 28.2	. .	42.0		133 24.5	14.8	3 38.9	11.9	55.1	
22	148 28.4		43.0		147 58.3	14.9	3 27.0	11.9	55.2	
23	163 28.6		44.0		162 32.2	14.9	3 15.1	12.0	55.2	
25 00	178 28.8	N	1 45.0		177 06.1	14.8	S 3 03.1	12.0	55.2	
01	193 28.9		46.0		191 39.9	14.9	2 51.1	12.0	55.2	
02	208 29.1		47.0		206 13.8	14.8	2 39.1	12.0	55.2	
03	223 29.3	. .	47.9		220 47.6	14.8	2 27.1	12.0	55.2	
04	238 29.5		48.9		235 21.4	14.9	2 15.1	12.1	55.3	
05	253 29.7		49.9		249 55.3	14.8	2 03.0	12.1	55.3	
06	268 29.9	N	1 50.9		264 29.1	14.8	S 1 50.9	12.1	55.3	
07	283 30.1		51.9		279 02.9	14.8	1 38.8	12.1	55.3	
D 08	298 30.3		52.9		293 36.7	14.7	1 26.7	12.1	55.3	
O 09	313 30.4	. .	53.8		308 10.4	14.8	1 14.6	12.1	55.4	
M 10	328 30.6		54.8		322 44.2	14.7	1 02.5	12.1	55.4	
I 11	343 30.8		55.8		337 17.9	14.8	0 50.4	12.2	55.4	
N 12	358 31.0	N	1 56.8		351 51.7	14.7	S 0 38.2	12.2	55.4	
G 13	13 31.2		57.8		6 25.4	14.7	0 26.0	12.1	55.4	
O 14	28 31.4		58.8		20 59.1	14.6	0 13.9	12.2	55.4	
15	43 31.6		1 59.7		35 32.7	14.7	S 0 01.7	12.2	55.5	
16	58 31.8		2 00.7		50 06.4	14.6	N 0 10.5	12.2	55.5	
17	73 32.0		01.7		64 40.0	14.7	0 22.7	12.2	55.5	
18	88 32.1	N	2 02.7		79 13.7	14.6	N 0 34.9	12.2	55.5	
19	103 32.3		03.7		93 47.3	14.5	0 47.1	12.3	55.5	
20	118 32.5		04.6		108 20.8	14.6	0 59.4	12.2	55.6	
21	133 32.7	. .	05.6		122 54.4	14.5	1 11.6	12.2	55.6	
22	148 32.9		06.6		137 27.9	14.5	1 23.8	12.2	55.6	
23	163 33.1		07.6		152 01.4	14.5	N 1 36.0	12.3	55.6	
	SD 16.1	d	1.0		SD	14.9		15.0		15.1

Lat.	Crepúsculo Náutico	Crepúsculo Civil	Orto Sol	Orto Luna 23	Orto Luna 24	Orto Luna 25	Orto Luna 26
°	h m	h m	h m	h m	h m	h m	h m
N 72	02 53	04 28	05 38	07 25	07 04	06 46	06 28
N 70	03 16	04 38	05 41	07 08	06 55	06 43	06 32
68	03 34	04 47	05 43	06 54	06 47	06 41	06 35
66	03 48	04 53	05 45	06 43	06 41	06 40	06 38
64	04 00	04 59	05 47	06 33	06 36	06 38	06 40
62	04 09	05 04	05 48	06 25	06 31	06 37	06 43
60	04 17	05 08	05 50	06 18	06 27	06 36	06 44
N 58	04 24	05 11	05 51	06 11	06 24	06 35	06 46
56	04 30	05 14	05 52	06 06	06 21	06 34	06 48
54	04 35	05 17	05 53	06 01	06 18	06 33	06 49
52	04 40	05 20	05 53	05 56	06 15	06 33	06 50
50	04 44	05 22	05 54	05 52	06 13	06 32	06 51
45	04 52	05 26	05 56	05 43	06 07	06 31	06 54
N 40	04 58	05 30	05 57	05 36	06 03	06 29	06 56
35	05 03	05 33	05 58	05 29	05 59	06 28	06 58
30	05 07	05 35	05 59	05 24	05 56	06 27	06 59
20	05 13	05 39	06 01	05 14	05 50	06 26	07 02
N 10	05 17	05 41	06 02	05 05	05 45	06 24	07 04
0	05 18	05 42	06 03	04 57	05 40	06 23	07 07
S 10	05 19	05 43	06 04	04 49	05 35	06 22	07 09
20	05 17	05 43	06 05	04 40	05 30	06 21	07 12
30	05 14	05 42	06 06	04 30	05 24	06 19	07 15
35	05 12	05 41	06 06	04 24	05 21	06 18	07 16
40	05 08	05 40	06 07	04 17	05 17	06 17	07 18
45	05 04	05 38	06 07	04 10	05 12	06 16	07 21
S 50	04 58	05 36	06 08	04 00	05 07	06 15	07 23
52	04 55	05 35	06 08	03 56	05 04	06 14	07 25
54	04 52	05 33	06 09	03 51	05 02	06 13	07 26
56	04 48	05 32	06 09	03 46	04 59	06 12	07 27
58	04 44	05 30	06 09	03 40	04 55	06 12	07 29
S 60	04 39	05 28	06 10	03 33	04 51	06 11	07 31

Lat.	Ocaso Sol	Crepúsculo Civil	Crepúsculo Náutico	Ocaso Luna 23	Ocaso Luna 24	Ocaso Luna 25	Ocaso Luna 26
°	h m	h m	h m	h m	h m	h m	h m
N 72	18 38	19 48	21 26	15 11	17 03	18 53	20 45
N 70	18 34	19 37	21 01	15 27	17 10	18 52	20 36
68	18 32	19 28	20 42	15 39	17 15	18 51	20 29
66	18 29	19 21	20 27	15 49	17 19	18 50	20 23
64	18 27	19 16	20 15	15 57	17 23	18 50	20 18
62	18 26	19 11	20 06	16 04	17 26	18 49	20 14
60	18 24	19 06	19 57	16 10	17 29	18 49	20 10
N 58	18 23	19 03	19 50	16 16	17 32	18 48	20 07
56	18 22	18 59	19 44	16 21	17 34	18 48	20 04
54	18 21	18 57	19 39	16 25	17 36	18 48	20 01
52	18 20	18 54	19 34	16 29	17 38	18 48	19 59
50	18 19	18 52	19 30	16 32	17 39	18 47	19 57
45	18 18	18 47	19 22	16 40	17 43	18 47	19 52
N 40	18 16	18 43	19 15	16 46	17 46	18 46	19 48
35	18 15	18 40	19 10	16 51	17 48	18 46	19 45
30	18 14	18 38	19 06	16 56	17 51	18 46	19 42
20	18 12	18 34	19 00	17 04	17 54	18 45	19 37
N 10	18 11	18 32	18 56	17 11	17 58	18 44	19 32
0	18 09	18 30	18 54	17 18	18 01	18 44	19 28
S 10	18 08	18 29	18 54	17 24	18 04	18 43	19 24
20	18 07	18 29	18 55	17 31	18 07	18 43	19 19
30	18 06	18 30	18 58	17 39	18 11	18 42	19 14
35	18 06	18 31	19 00	17 43	18 13	18 42	19 11
40	18 05	18 32	19 03	17 49	18 15	18 41	19 08
45	18 04	18 33	19 08	17 54	18 18	18 41	19 04
S 50	18 03	18 36	19 13	18 01	18 21	18 40	19 00
52	18 03	18 37	19 16	18 05	18 23	18 40	18 58
54	18 03	18 38	19 19	18 08	18 24	18 40	18 55
56	18 02	18 39	19 23	18 12	18 26	18 39	18 53
58	18 02	18 41	19 27	18 16	18 28	18 39	18 50
S 60	18 01	18 43	19 32	18 21	18 30	18 38	18 47

Día	SOL E.T. (−) 00h	SOL E.T. (−) 12h	SOL Pas. Mer.	LUNA Pas. Sup.	LUNA Mer. Inf.	LUNA Edad	LUNA Fase
d	m s	m s	h m	h m	h m	d	%
23	06 41	06 32	12 07	11 07	23 29	28	2
24	06 23	06 14	12 06	11 50	24 12	29	0
25	06 05	05 56	12 06	12 34	00 12	00	0

T.U.	ARIES	VENUS −4.1		MARTE −0.1		JUPITER −2.1		SATURNO +0.2	
	A.H.G.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
26 00	183 30.3	175 40.2	N12 24.2	286 05.2	S22 29.0	118 40.3	N20 55.6	128 09.8	N17 45.0
01	198 32.7	190 44.0	23.6	301 06.6	29.1	133 42.3	55.6	143 12.1	45.0
02	213 35.2	205 47.8	22.9	316 08.0	29.2	148 44.4	55.7	158 14.3	45.1
03	228 37.7	220 51.7	22.2	331 09.4	29.4	163 46.4	55.8	173 16.5	45.1
04	243 40.1	235 55.5	21.6	346 10.8	29.5	178 48.4	55.9	188 18.7	45.2
05	258 42.6	250 59.3	20.9	1 12.2	29.7	193 50.5	55.9	203 20.9	45.3
06	273 45.1	266 03.1	N12 20.2	16 13.6	S22 29.8	208 52.5	N20 56.0	218 23.2	N17 45.3
07	288 47.5	281 06.9	19.5	31 15.0	29.9	223 54.5	56.1	233 25.4	45.4
08	303 50.0	296 10.7	18.9	46 16.4	30.1	238 56.6	56.2	248 27.6	45.5
L 09	318 52.5	311 14.6	18.2	61 17.8	30.2	253 58.6	56.3	263 29.8	45.5
U 10	333 54.9	326 18.4	17.5	76 19.3	30.4	269 00.6	56.3	278 32.0	45.6
N 11	348 57.4	341 22.2	16.8	91 20.7	30.5	284 02.6	56.4	293 34.3	45.7
E 12	3 59.9	356 26.0	N12 16.1	106 22.1	S22 30.6	299 04.7	N20 56.5	308 36.5	N17 45.7
S 13	19 02.3	11 29.8	15.4	121 23.5	30.8	314 06.7	56.6	323 38.7	45.8
14	34 04.8	26 33.7	14.7	136 24.9	30.9	329 08.7	56.6	338 40.9	45.8
15	49 07.2	41 37.5	14.0	151 26.3	31.0	344 10.8	56.7	353 43.1	45.9
16	64 09.7	56 41.3	13.4	166 27.7	31.2	359 12.8	56.8	8 45.3	46.0
17	79 12.2	71 45.1	12.7	181 29.1	31.3	14 14.8	56.9	23 47.6	46.0
18	94 14.6	86 49.0	N12 12.0	196 30.5	S22 31.5	29 16.8	N20 56.9	38 49.8	N17 46.1
19	109 17.1	101 52.8	11.3	211 31.9	31.6	44 18.9	57.0	53 52.0	46.2
20	124 19.6	116 56.6	10.6	226 33.3	31.7	59 20.9	57.1	68 54.2	46.2
21	139 22.0	132 00.4	09.8	241 34.8	31.9	74 22.9	57.2	83 56.4	46.3
22	154 24.5	147 04.3	09.1	256 36.2	32.0	89 25.0	57.3	98 58.7	46.3
23	169 27.0	162 08.1	08.4	271 37.6	32.1	104 27.0	57.3	114 00.9	46.4
27 00	184 29.4	177 11.9	N12 07.7	286 39.0	S22 32.3	119 29.0	N20 57.4	129 03.1	N17 46.5
01	199 31.9	192 15.8	07.0	301 40.4	32.4	134 31.0	57.5	144 05.3	46.5
02	214 34.3	207 19.6	06.3	316 41.8	32.6	149 33.1	57.6	159 07.5	46.6
03	229 36.8	222 23.4	05.6	331 43.2	32.7	164 35.1	57.6	174 09.7	46.7
04	244 39.3	237 27.3	04.9	346 44.7	32.8	179 37.1	57.7	189 12.0	46.7
05	259 41.7	252 31.1	04.1	1 46.1	33.0	194 39.1	57.8	204 14.2	46.8
06	274 44.2	267 34.9	N12 03.4	16 47.5	S22 33.1	209 41.2	N20 57.9	219 16.4	N17 46.9
07	289 46.7	282 38.7	02.7	31 48.9	33.2	224 43.2	57.9	234 18.6	46.9
M 08	304 49.1	297 42.6	02.0	46 50.3	33.4	239 45.2	58.0	249 20.8	47.0
A 09	319 51.6	312 46.4	01.2	61 51.7	33.5	254 47.2	58.1	264 23.0	47.0
R 10	334 54.1	327 50.2	12 00.5	76 53.2	33.6	269 49.3	58.2	279 25.3	47.1
T 11	349 56.5	342 54.1	11 59.8	91 54.6	33.8	284 51.3	58.3	294 27.5	47.2
E 12	4 59.0	357 57.9	N11 59.0	106 56.0	S22 33.9	299 53.3	N20 58.3	309 29.7	N17 47.2
S 13	20 01.5	13 01.7	58.3	121 57.4	34.0	314 55.3	58.4	324 31.9	47.3
14	35 03.9	28 05.6	57.6	136 58.8	34.2	329 57.4	58.5	339 34.1	47.4
15	50 06.4	43 09.4	56.8	152 00.3	34.3	344 59.4	58.6	354 36.3	47.4
16	65 08.8	58 13.2	56.1	167 01.7	34.5	0 01.4	58.6	9 38.6	47.5
17	80 11.3	73 17.1	55.3	182 03.1	34.6	15 03.4	58.7	24 40.8	47.5
18	95 13.8	88 20.9	N11 54.6	197 04.5	S22 34.7	30 05.4	N20 58.8	39 43.0	N17 47.6
19	110 16.2	103 24.8	53.8	212 06.0	34.9	45 07.5	58.9	54 45.2	47.7
20	125 18.7	118 28.6	53.1	227 07.4	35.0	60 09.5	58.9	69 47.4	47.7
21	140 21.2	133 32.4	52.3	242 08.8	35.1	75 11.5	59.0	84 49.6	47.8
22	155 23.6	148 36.3	51.6	257 10.2	35.3	90 13.5	59.1	99 51.8	47.9
23	170 26.1	163 40.1	50.8	272 11.7	35.4	105 15.6	59.2	114 54.1	47.9
28 00	185 28.6	178 43.9	N11 50.1	287 13.1	S22 35.5	120 17.6	N20 59.3	129 56.3	N17 48.0
01	200 31.0	193 47.8	49.3	302 14.5	35.7	135 19.6	59.3	144 58.5	48.1
02	215 33.5	208 51.6	48.5	317 15.9	35.8	150 21.6	59.4	160 00.7	48.1
03	230 36.0	223 55.4	47.8	332 17.4	35.9	165 23.6	59.5	175 02.9	48.2
04	245 38.4	238 59.3	47.0	347 18.8	36.1	180 25.7	59.6	190 05.1	48.2
05	260 40.9	254 03.1	46.2	2 20.2	36.2	195 27.7	59.6	205 07.3	48.3
06	275 43.3	269 06.9	N11 45.5	17 21.7	S22 36.3	210 29.7	N20 59.7	220 09.6	N17 48.4
M 07	290 45.8	284 10.8	44.7	32 23.1	36.5	225 31.7	59.8	235 11.8	48.4
I 08	305 48.3	299 14.6	43.9	47 24.5	36.6	240 33.7	20 59.9	250 14.0	48.5
E 09	320 50.7	314 18.5	43.2	62 26.0	36.7	255 35.8	21 00.0	265 16.2	48.6
R 10	335 53.2	329 22.3	42.4	77 27.4	36.9	270 37.8	00.0	280 18.4	48.6
C 11	350 55.7	344 26.1	41.6	92 28.8	37.0	285 39.8	00.1	295 20.6	48.7
O 12	5 58.1	359 30.0	N11 40.8	107 30.3	S22 37.1	300 41.8	N21 00.2	310 22.8	N17 48.8
L 13	21 00.6	14 33.8	40.0	122 31.7	37.3	315 43.8	00.3	325 25.1	48.8
E 14	36 03.1	29 37.6	39.3	137 33.1	37.4	330 45.9	00.3	340 27.3	48.9
S 15	51 05.5	44 41.5	38.5	152 34.6	37.5	345 47.9	00.4	355 29.5	48.9
16	66 08.0	59 45.3	37.7	167 36.0	37.7	0 49.9	00.5	10 31.7	49.0
17	81 10.4	74 49.1	36.9	182 37.4	37.8	15 51.9	00.6	25 33.9	49.1
18	96 12.9	89 53.0	N11 36.1	197 38.9	S22 37.9	30 53.9	N21 00.7	40 36.1	N17 49.1
19	111 15.4	104 56.8	35.3	212 40.3	38.1	45 55.9	00.7	55 38.3	49.2
20	126 17.8	120 00.6	34.5	227 41.7	38.2	60 58.0	00.8	70 40.5	49.3
21	141 20.3	135 04.5	33.7	242 43.2	38.3	76 00.0	00.9	85 42.8	49.3
22	156 22.8	150 08.3	32.9	257 44.6	38.5	91 02.0	01.0	100 45.0	49.4
23	171 25.2	165 12.2	32.1	272 46.1	38.6	106 04.0	01.0	115 47.2	49.5
	h m								
Pas. Mer.	11 40.1	v 3.8	d 0.7	v 1.4	d 0.1	v 2.0	d 0.1	v 2.2	d 0.1

ESTRELLAS

Nombre	A.H.S.	Dec.
	° ′	° ′
Acamar	315 25.9	S40 18.3
Achernar	335 34.4	S57 14.1
Acrux	173 19.5	S63 06.3
Adhara	255 20.0	S28 58.7
Aldebaran	291 00.6	N16 30.6
Alioth	166 28.4	N55 57.2
Alkaid	153 05.9	N49 18.4
Al Na'ir	27 56.1	S46 57.4
Alnilam	275 56.2	S 1 12.2
Alphard	218 05.3	S 8 39.9
Alphecca	126 18.9	N26 42.5
Alpheratz	357 53.8	N29 05.6
Altair	62 17.7	N 8 52.1
Ankaa	353 25.5	S42 18.2
Antares	112 37.9	S26 26.0
Arcturus	146 04.2	N19 10.5
Atria	107 48.2	S69 01.5
Avior	234 21.7	S59 31.1
Bellatrix	278 42.4	N 6 20.9
Betelgeuse	271 11.7	N 7 24.3
Canopus	264 00.4	S52 42.1
Capella	280 48.8	N46 00.0
Deneb	49 38.3	N45 16.7
Denebola	182 43.1	N14 33.9
Diphda	349 05.8	S17 59.0
Dubhe	194 02.7	N61 44.8
Elnath	278 24.9	N28 36.5
Eltanin	90 50.5	N51 29.0
Enif	33 56.8	N 9 52.6
Fomalhaut	15 34.8	S29 37.1
Gacrux	172 11.2	S57 07.2
Gienah	176 01.9	S17 32.9
Hadar	149 01.1	S60 22.6
Hamal	328 11.9	N23 27.9
Kaus Aust.	83 56.5	S34 23.0
Kochab	137 18.6	N74 08.9
Markab	13 48.2	N15 12.4
Menkar	314 25.4	N 4 05.5
Menkent	148 18.6	S36 22.5
Miaplacidus	221 41.2	S69 43.5
Mirfak	308 54.5	N49 51.9
Nunki	76 10.2	S26 17.7
Peacock	53 34.5	S56 43.8
Pollux	243 39.3	N28 01.4
Procyon	245 09.7	N 5 13.2
Rasalhague	96 15.3	N12 33.4
Regulus	207 53.5	N11 57.7
Rigel	281 21.4	S 8 12.2
Rigil Kent.	140 04.5	S60 50.2
Sabik	102 23.5	S15 43.6
Schedar	349 52.2	N56 32.5
Shaula	96 34.9	S37 06.2
Sirius	258 42.2	S16 43.3
Spica	158 41.1	S11 10.1
Suhail	222 59.3	S43 26.4
Vega	80 45.5	N38 46.8
Zuben'ubi	137 15.8	S16 02.8

	A.H.S.	Pas. Mer.
	° ′	h m
Venus	352 42.5	12 08
Marte	102 09.6	4 53
Júpiter	294 59.6	16 00
Saturno	304 33.7	15 22

T.U.	SOL				LUNA					
	A.H.G.		Dec.		A.H.G.	v	Dec.	d	P.H.	
d h	° ′		° ′		° ′	′	° ′	′	′	
26 00	178 33.3	N	2 08.6		166 34.9	14.5	N 1 48.3	12.2	55.6	
01	193 33.5		09.6		181 08.4	14.4	2 00.5	12.2	55.7	
02	208 33.6		10.5		195 41.8	14.4	2 12.7	12.3	55.7	
03	223 33.8	. .	11.5		210 15.2	14.4	2 25.0	12.2	55.7	
04	238 34.0		12.5		224 48.6	14.3	2 37.2	12.2	55.7	
05	253 34.2		13.5		239 21.9	14.4	2 49.4	12.2	55.7	
06	268 34.4	N	2 14.5		253 55.3	14.3	N 3 01.6	12.2	55.7	
07	283 34.6		15.4		268 28.6	14.2	3 13.8	12.3	55.8	
L 08	298 34.8		16.4		283 01.8	14.2	3 26.1	12.2	55.8	
09	313 35.0	. .	17.4		297 35.0	14.2	3 38.3	12.2	55.8	
U 10	328 35.2		18.4		312 08.2	14.2	3 50.5	12.1	55.8	
11	343 35.3		19.4		326 41.4	14.1	4 02.6	12.2	55.8	
N 12	358 35.5	N	2 20.3		341 14.5	14.1	N 4 14.8	12.2	55.9	
E 13	13 35.7		21.3		355 47.6	14.1	4 27.0	12.1	55.9	
14	28 35.9		22.3		10 20.7	14.0	4 39.1	12.2	55.9	
S 15	43 36.1	. .	23.3		24 53.7	14.0	4 51.3	12.1	55.9	
16	58 36.3		24.3		39 26.7	14.0	5 03.4	12.1	55.9	
17	73 36.5		25.2		53 59.7	13.9	5 15.5	12.2	56.0	
18	88 36.7	N	2 26.2		68 32.6	13.8	N 5 27.7	12.0	56.0	
19	103 36.9		27.2		83 05.4	13.9	5 39.7	12.1	56.0	
20	118 37.0		28.2		97 38.3	13.8	5 51.8	12.1	56.0	
21	133 37.2	. .	29.2		112 11.1	13.7	6 03.9	12.0	56.0	
22	148 37.4		30.1		126 43.8	13.7	6 15.9	12.0	56.1	
23	163 37.6		31.1		141 16.5	13.7	6 27.9	12.0	56.1	
27 00	178 37.8	N	2 32.1		155 49.2	13.6	N 6 39.9	12.0	56.1	
01	193 38.0		33.1		170 21.8	13.6	6 51.9	11.9	56.1	
02	208 38.2		34.1		184 54.4	13.5	7 03.8	12.0	56.1	
03	223 38.4	. .	35.0		199 26.9	13.5	7 15.8	11.9	56.2	
04	238 38.6		36.0		213 59.4	13.5	7 27.7	11.9	56.2	
05	253 38.7		37.0		228 31.9	13.4	7 39.6	11.8	56.2	
06	268 38.9	N	2 38.0		243 04.3	13.3	N 7 51.4	11.8	56.2	
07	283 39.1		39.0		257 36.6	13.3	8 03.2	11.8	56.2	
M 08	298 39.3		39.9		272 08.9	13.2	8 15.0	11.8	56.3	
09	313 39.5	. .	40.9		286 41.1	13.2	8 26.8	11.7	56.3	
A 10	328 39.7		41.9		301 13.3	13.2	8 38.5	11.7	56.3	
R 11	343 39.9		42.9		315 45.5	13.1	8 50.2	11.7	56.3	
T 12	358 40.1	N	2 43.9		330 17.6	13.0	N 9 01.9	11.6	56.3	
13	13 40.3		44.8		344 49.6	13.0	9 13.5	11.6	56.4	
E 14	28 40.4		45.8		359 21.6	12.9	9 25.1	11.6	56.4	
15	43 40.6	. .	46.8		13 53.5	12.9	9 36.7	11.5	56.4	
S 16	58 40.8		47.8		28 25.4	12.8	9 48.2	11.5	56.4	
17	73 41.0		48.7		42 57.2	12.8	9 59.7	11.5	56.5	
18	88 41.2	N	2 49.7		57 29.0	12.7	N10 11.2	11.4	56.5	
19	103 41.4		50.7		72 00.7	12.6	10 22.6	11.4	56.5	
20	118 41.6		51.7		86 32.3	12.6	10 34.0	11.3	56.5	
21	133 41.8	. .	52.7		101 03.9	12.6	10 45.3	11.3	56.5	
22	148 41.9		53.6		115 35.5	12.4	10 56.6	11.2	56.6	
23	163 42.1		54.6		130 06.9	12.5	11 07.8	11.2	56.6	
28 00	178 42.3	N	2 55.6		144 38.4	12.3	N11 19.0	11.2	56.6	
01	193 42.5		56.6		159 09.7	12.3	11 30.2	11.1	56.6	
02	208 42.7		57.5		173 41.0	12.2	11 41.3	11.0	56.6	
03	223 42.9	. .	58.5		188 12.2	12.2	11 52.3	11.1	56.7	
04	238 43.1		2 59.5		202 43.4	12.1	12 03.4	10.9	56.7	
05	253 43.3		3 00.5		217 14.5	12.0	12 14.3	10.9	56.7	
06	268 43.5	N	3 01.4		231 45.5	12.0	N12 25.2	10.9	56.7	
M 07	283 43.6		02.4		246 16.5	11.9	12 36.1	10.8	56.7	
I 08	298 43.8		03.4		260 47.4	11.9	12 46.9	10.7	56.8	
E 09	313 44.0	. .	04.4		275 18.3	11.8	12 57.6	10.7	56.8	
R 10	328 44.2		05.4		289 49.1	11.7	13 08.3	10.6	56.8	
C 11	343 44.4		06.3		304 19.8	11.6	13 18.9	10.6	56.8	
O 12	358 44.6	N	3 07.3		318 50.4	11.6	N13 29.5	10.5	56.8	
L 13	13 44.8		08.3		333 21.0	11.5	13 40.0	10.5	56.9	
14	28 45.0		09.3		347 51.5	11.4	13 50.5	10.3	56.9	
E 15	43 45.2	. .	10.2		2 21.9	11.4	14 00.8	10.4	56.9	
S 16	58 45.3		11.2		16 52.3	11.3	14 11.2	10.2	56.9	
17	73 45.5		12.2		31 22.6	11.2	14 21.4	10.2	57.0	
18	88 45.7	N	3 13.2		45 52.8	11.2	N14 31.6	10.1	57.0	
19	103 45.9		14.1		60 23.0	11.1	14 41.7	10.1	57.0	
20	118 46.1		15.1		74 53.1	11.0	14 51.8	10.0	57.0	
21	133 46.3	. .	16.1		89 23.1	10.9	15 01.8	9.9	57.0	
22	148 46.5		17.1		103 53.0	10.9	15 11.7	9.9	57.1	
23	163 46.7		18.0		118 22.9	10.8	N15 21.6	9.8	57.1	
	SD 16.1		d 1.0		SD 15.2		15.4		15.5	

Lat.	Crepúsculo Náutico	Crepúsculo Civil	Orto Sol	Orto Luna 26	Orto Luna 27	Orto Luna 28	Orto Luna 29
°	h m	h m	h m	h m	h m	h m	h m
N 72	02 28	04 11	05 22	06 28	06 09	05 45	05 05
N 70	02 57	04 23	05 27	06 32	06 20	06 06	05 46
68	03 18	04 33	05 30	06 35	06 29	06 22	06 14
66	03 34	04 41	05 34	06 38	06 37	06 36	06 36
64	03 47	04 48	05 36	06 40	06 43	06 47	06 53
62	03 58	04 53	05 38	06 43	06 49	06 57	07 07
60	04 07	04 58	05 40	06 44	06 54	07 05	07 20
N 58	04 14	05 03	05 42	06 46	06 58	07 12	07 30
56	04 21	05 06	05 44	06 48	07 02	07 19	07 39
54	04 27	05 10	05 45	06 49	07 05	07 24	07 47
52	04 32	05 13	05 47	06 50	07 09	07 30	07 55
50	04 37	05 15	05 48	06 51	07 12	07 34	08 01
45	04 46	05 21	05 50	06 54	07 18	07 45	08 16
N 40	04 53	05 25	05 52	06 56	07 23	07 53	08 28
35	04 59	05 29	05 54	06 58	07 28	08 01	08 38
30	05 04	05 32	05 55	06 59	07 32	08 07	08 47
20	05 10	05 36	05 58	07 02	07 39	08 19	09 02
N 10	05 15	05 39	06 00	07 04	07 46	08 29	09 16
0	05 17	05 41	06 02	07 07	07 52	08 39	09 28
S 10	05 19	05 43	06 04	07 09	07 58	08 48	09 41
20	05 18	05 44	06 06	07 12	08 04	08 58	09 55
30	05 16	05 44	06 08	07 15	08 12	09 10	10 11
35	05 14	05 44	06 09	07 16	08 16	09 17	10 20
40	05 11	05 43	06 10	07 18	08 21	09 25	10 31
45	05 08	05 42	06 11	07 21	08 27	09 34	10 43
S 50	05 03	05 41	06 13	07 23	08 34	09 45	10 59
52	05 00	05 40	06 13	07 25	08 37	09 51	11 06
54	04 58	05 39	06 14	07 26	08 40	09 56	11 14
56	04 55	05 38	06 15	07 27	08 44	10 03	11 23
58	04 51	05 37	06 16	07 29	08 49	10 10	11 33
S 60	04 47	05 36	06 17	07 31	08 53	10 18	11 45

Lat.	Ocaso Sol	Crepúsculo Civil	Crepúsculo Náutico	Ocaso Luna 26	Ocaso Luna 27	Ocaso Luna 28	Ocaso Luna 29
°	h m	h m	h m	h m	h m	h m	h m
N 72	18 51	20 03	21 49	20 45	22 45	25 07	01 07
N 70	18 46	19 50	21 19	20 36	22 26	24 27	00 27
68	18 42	19 40	20 57	20 29	22 11	24 00	00 00
66	18 39	19 32	20 40	20 23	21 59	23 40	25 25
64	18 36	19 25	20 26	20 18	21 49	23 24	25 00
62	18 34	19 19	20 15	20 14	21 41	23 10	24 41
60	18 32	19 14	20 06	20 10	21 33	22 59	24 25
N 58	18 30	19 10	19 58	20 07	21 27	22 49	24 12
56	18 28	19 06	19 51	20 04	21 21	22 41	24 00
54	18 27	19 02	19 45	20 01	21 16	22 33	23 50
52	18 25	18 59	19 40	19 59	21 12	22 26	23 41
50	18 24	18 57	19 35	19 57	21 08	22 20	23 33
45	18 21	18 51	19 26	19 52	20 59	22 07	23 16
N 40	18 19	18 46	19 18	19 48	20 51	21 56	23 02
35	18 17	18 43	19 12	19 45	20 45	21 47	22 51
30	18 16	18 40	19 08	19 42	20 40	21 39	22 40
20	18 13	18 35	19 01	19 37	20 30	21 25	22 23
N 10	18 11	18 32	18 56	19 32	20 22	21 13	22 08
0	18 09	18 29	18 53	19 28	20 14	21 02	21 53
S 10	18 07	18 28	18 52	19 24	20 06	20 51	21 39
20	18 05	18 27	18 52	19 19	19 58	20 39	21 24
30	18 03	18 26	18 54	19 14	19 48	20 25	21 07
35	18 01	18 27	18 56	19 11	19 43	20 17	20 57
40	18 00	18 27	18 58	19 08	19 37	20 09	20 45
45	17 59	18 28	19 02	19 04	19 30	19 58	20 32
S 50	17 57	18 29	19 07	19 00	19 21	19 46	20 15
52	17 56	18 30	19 09	18 58	19 17	19 40	20 08
54	17 55	18 30	19 12	18 55	19 13	19 33	19 59
56	17 54	18 31	19 15	18 53	19 08	19 26	19 50
58	17 53	18 32	19 18	18 50	19 03	19 18	19 39
S 60	17 52	18 34	19 22	18 47	18 57	19 09	19 26

Día	SOL E.T. (−) 00h	SOL E.T. (−) 12h	SOL Pas. Mer.	LUNA Pas. Mer. Sup.	LUNA Pas. Mer. Inf.	LUNA Edad	LUNA Fase
d	m s	m s	h m	h m	h m	d %	
26	05 47	05 38	12 06	13 17	00 55	01 2	
27	05 29	05 20	12 05	14 03	01 40	02 6	●
28	05 11	05 02	12 05	14 50	02 26	03 12	

(JUE., VIE., SAB.) 29, 30, 31 MARZO DEL 2001

T.U.	ARIES	VENUS −4.1		MARTE −0.1		JUPITER −2.1		SATURNO +0.2	
	A.H.G.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
29 00	186 27.7	180 16.0	N11 31.3	287 47.5	S22 38.7	121 06.0	N21 01.1	130 49.4	N17 49.5
01	201 30.2	195 19.8	30.5	302 48.9	38.9	136 08.0	01.2	145 51.6	49.6
02	216 32.6	210 23.7	29.7	317 50.4	39.0	151 10.1	01.3	160 53.8	49.6
03	231 35.1	225 27.5 . .	28.9	332 51.8 . .	39.1	166 12.1 . .	01.3	175 56.0 . .	49.7
04	246 37.6	240 31.3	28.1	347 53.3	39.3	181 14.1	01.4	190 58.2	49.8
05	261 40.0	255 35.2	27.3	2 54.7	39.4	196 16.1	01.5	206 00.4	49.8
06	276 42.5	270 39.0	N11 26.5	17 56.2	S22 39.5	211 18.1	N21 01.6	221 02.7	N17 49.9
07	291 44.9	285 42.8	25.7	32 57.6	39.6	226 20.1	01.7	236 04.9	50.0
J 08	306 47.4	300 46.6	24.9	47 59.0	39.8	241 22.2	01.7	251 07.1	50.0
U 09	321 49.9	315 50.5 . .	24.1	63 00.5 . .	39.9	256 24.2 . .	01.8	266 09.3 . .	50.1
10	336 52.3	330 54.3	23.3	78 01.9	40.0	271 26.2	01.9	281 11.5	50.2
E 11	351 54.8	345 58.1	22.4	93 03.4	40.2	286 28.2	02.0	296 13.7	50.2
V 12	6 57.3	1 02.0	N11 21.6	108 04.8	S22 40.3	301 30.2	N21 02.0	311 15.9	N17 50.3
13	21 59.7	16 05.8	20.8	123 06.3	40.4	316 32.2	02.1	326 18.1	50.4
E 14	37 02.2	31 09.6	20.0	138 07.7	40.6	331 34.2	02.2	341 20.3	50.4
S 15	52 04.7	46 13.5 . .	19.2	153 09.2 . .	40.7	346 36.3 . .	02.3	356 22.5 . .	50.5
16	67 07.1	61 17.3	18.3	168 10.6	40.8	1 38.3	02.4	11 24.8	50.5
17	82 09.6	76 21.1	17.5	183 12.1	41.0	16 40.3	02.4	26 27.0	50.6
18	97 12.0	91 24.9	N11 16.7	198 13.5	S22 41.1	31 42.3	N21 02.5	41 29.2	N17 50.7
19	112 14.5	106 28.8	15.9	213 15.0	41.2	46 44.3	02.6	56 31.4	50.7
20	127 17.0	121 32.6	15.0	228 16.4	41.3	61 46.3	02.7	71 33.6	50.8
21	142 19.4	136 36.4 . .	14.2	243 17.9 . .	41.5	76 48.3 . .	02.7	86 35.8 . .	50.9
22	157 21.9	151 40.2	13.4	258 19.3	41.6	91 50.3	02.8	101 38.0	50.9
23	172 24.4	166 44.1	12.5	273 20.8	41.7	106 52.4	02.9	116 40.2	51.0
30 00	187 26.8	181 47.9	N11 11.7	288 22.2	S22 41.9	121 54.4	N21 03.0	131 42.4	N17 51.1
01	202 29.3	196 51.7	10.9	303 23.7	42.0	136 56.4	03.1	146 44.6	51.1
02	217 31.8	211 55.5	10.0	318 25.1	42.1	151 58.4	03.1	161 46.9	51.2
03	232 34.2	226 59.3 . .	09.2	333 26.6 . .	42.2	167 00.4 . .	03.2	176 49.1 . .	51.3
04	247 36.7	242 03.2	08.3	348 28.1	42.4	182 02.4	03.3	191 51.3	51.3
05	262 39.2	257 07.0	07.5	3 29.5	42.5	197 04.4	03.4	206 53.5	51.4
06	277 41.6	272 10.8	N11 06.6	18 31.0	S22 42.6	212 06.4	N21 03.4	221 55.7	N17 51.4
07	292 44.1	287 14.6	05.8	33 32.4	42.8	227 08.4	03.5	236 57.9	51.5
V 08	307 46.5	302 18.4	04.9	48 33.9	42.9	242 10.5	03.6	252 00.1	51.6
I 09	322 49.0	317 22.3 . .	04.1	63 35.4 . .	43.0	257 12.5 . .	03.7	267 02.3 . .	51.6
E 10	337 51.5	332 26.1	03.3	78 36.8	43.1	272 14.5	03.8	282 04.5	51.7
R 11	352 53.9	347 29.9	02.4	93 38.3	43.3	287 16.5	03.8	297 06.7	51.8
N 12	7 56.4	2 33.7	N11 01.5	108 39.7	S22 43.4	302 18.5	N21 03.9	312 08.9	N17 51.8
13	22 58.9	17 37.5	11 00.7	123 41.2	43.5	317 20.5	04.0	327 11.1	51.9
E 14	38 01.3	32 41.3	10 59.8	138 42.7	43.7	332 22.5	04.1	342 13.3	52.0
S 15	53 03.8	47 45.1 . .	59.0	153 44.1 . .	43.8	347 24.5 . .	04.1	357 15.6 . .	52.0
16	68 06.3	62 48.9	58.1	168 45.6	43.9	2 26.5	04.2	12 17.8	52.1
17	83 08.7	77 52.8	57.3	183 47.0	44.0	17 28.5	04.3	27 20.0	52.2
18	98 11.2	92 56.6	N10 56.4	198 48.5	S22 44.2	32 30.5	N21 04.4	42 22.2	N17 52.2
19	113 13.7	108 00.4	55.5	213 50.0	44.3	47 32.6	04.5	57 24.4	52.3
20	128 16.1	123 04.2	54.7	228 51.4	44.4	62 34.6	04.5	72 26.6	52.3
21	143 18.6	138 08.0 . .	53.8	243 52.9 . .	44.6	77 36.6 . .	04.6	87 28.8 . .	52.4
22	158 21.0	153 11.8	52.9	258 54.4	44.7	92 38.6	04.7	102 31.0	52.5
23	173 23.5	168 15.6	52.1	273 55.8	44.8	107 40.6	04.8	117 33.2	52.5
31 00	188 26.0	183 19.4	N10 51.2	288 57.3	S22 44.9	122 42.6	N21 04.8	132 35.4	N17 52.6
01	203 28.4	198 23.2	50.3	303 58.8	45.1	137 44.6	04.9	147 37.6	52.7
02	218 30.9	213 27.0	49.5	319 00.3	45.2	152 46.6	05.0	162 39.8	52.7
03	233 33.4	228 30.8 . .	48.6	334 01.7 . .	45.3	167 48.6 . .	05.1	177 42.0 . .	52.8
04	248 35.8	243 34.6	47.7	349 03.2	45.4	182 50.6	05.2	192 44.2	52.9
05	263 38.3	258 38.4	46.8	4 04.7	45.6	197 52.6	05.2	207 46.4	52.9
06	278 40.8	273 42.2	N10 46.0	19 06.1	S22 45.7	212 54.6	N21 05.3	222 48.6	N17 53.0
S 07	293 43.2	288 46.0	45.1	34 07.6	45.8	227 56.6	05.4	237 50.9	53.1
08	308 45.7	303 49.8	44.2	49 09.1	46.0	242 58.6	05.5	252 53.1	53.1
A 09	323 48.2	318 53.6 . .	43.3	64 10.6 . .	46.1	258 00.6 . .	05.5	267 55.3 . .	53.2
B 10	338 50.6	333 57.4	42.5	79 12.0	46.2	273 02.7	05.6	282 57.5	53.3
11	353 53.1	349 01.2	41.6	94 13.5	46.3	288 04.7	05.7	297 59.7	53.3
A 12	8 55.5	4 05.0	N10 40.7	109 15.0	S22 46.5	303 06.7	N21 05.8	313 01.9	N17 53.4
13	23 58.0	19 08.7	39.8	124 16.5	46.6	318 08.7	05.9	328 04.1	53.4
D 14	39 00.5	34 12.5	38.9	139 17.9	46.7	333 10.7	05.9	343 06.3	53.5
15	54 02.9	49 16.3 . .	38.0	154 19.4 . .	46.8	348 12.7 . .	06.0	358 08.5 . .	53.6
O 16	69 05.4	64 20.1	37.2	169 20.9	47.0	3 14.7	06.1	13 10.7	53.6
17	84 07.9	79 23.9	36.3	184 22.4	47.1	18 16.7	06.2	28 12.9	53.7
18	99 10.3	94 27.7	N10 35.4	199 23.8	S22 47.2	33 18.7	N21 06.2	43 15.1	N17 53.8
19	114 12.8	109 31.5	34.5	214 25.3	47.3	48 20.7	06.3	58 17.3	53.8
20	129 15.3	124 35.2	33.6	229 26.8	47.5	63 22.7	06.4	73 19.5	53.9
21	144 17.7	139 39.0 . .	32.7	244 28.3 . .	47.6	78 24.7 . .	06.5	88 21.7 . .	54.0
22	159 20.2	154 42.8	31.8	259 29.8	47.7	93 26.7	06.6	103 23.9	54.0
23	174 22.6	169 46.6	30.9	274 31.2	47.8	108 28.7	06.6	118 26.1	54.1
	h m								
Pas. Mer.	11 28.3	*v* 3.8	*d* 0.9	*v* 1.5	*d* 0.1	*v* 2.0	*d* 0.1	*v* 2.2	*d* 0.1

ESTRELLAS

Nombre	A.H.S.	Dec.
	° ′	° ′
Acamar	315 25.9	S40 18.3
Achernar	335 34.4	S57 14.1
Acrux	173 19.5	S63 06.3
Adhara	255 20.1	S28 58.7
Aldebaran	291 00.6	N16 30.6
Alioth	166 28.4	N55 57.2
Alkaid	153 05.9	N49 18.4
Al Na'ir	27 56.0	S46 57.3
Alnilam	275 56.2	S 1 12.2
Alphard	218 05.3	S 8 39.9
Alphecca	126 18.9	N26 42.5
Alpheratz	357 53.8	N29 05.6
Altair	62 17.7	N 8 52.1
Ankaa	353 25.5	S42 18.2
Antares	112 37.9	S26 26.0
Arcturus	146 04.2	N19 10.5
Atria	107 48.2	S69 01.5
Avior	234 21.7	S59 31.1
Bellatrix	278 42.4	N 6 20.9
Betelgeuse	271 11.8	N 7 24.3
Canopus	264 00.5	S52 42.1
Capella	280 48.8	N46 00.0
Deneb	49 38.3	N45 16.7
Denebola	182 43.1	N14 33.9
Diphda	349 05.8	S17 59.0
Dubhe	194 02.7	N61 44.8
Elnath	278 24.9	N28 36.5
Eltanin	90 50.5	N51 29.0
Enif	33 56.8	N 9 52.6
Fomalhaut	15 34.8	S29 37.1
Gacrux	172 11.2	S57 07.2
Gienah	176 01.9	S17 33.0
Hadar	149 01.1	S60 22.6
Hamal	328 11.9	N23 27.9
Kaus Aust.	83 56.5	S34 23.0
Kochab	137 18.5	N74 08.9
Markab	13 48.2	N15 12.4
Menkar	314 25.4	N 4 05.5
Menkent	148 18.6	S36 22.5
Miaplacidus	221 41.3	S69 43.5
Mirfak	308 54.5	N49 51.9
Nunki	76 10.2	S26 17.7
Peacock	53 34.5	S56 43.8
Pollux	243 39.4	N28 01.4
Procyon	245 09.7	N 5 13.2
Rasalhague	96 15.3	N12 33.4
Regulus	207 53.5	N11 57.7
Rigel	281 21.4	S 8 12.2
Rigil Kent.	140 04.5	S60 50.2
Sabik	102 23.4	S15 43.6
Schedar	349 52.2	N56 32.5
Shaula	96 34.8	S37 06.2
Sirius	258 42.2	S16 43.3
Spica	158 41.1	S11 10.1
Suhail	222 59.3	S43 26.5
Vega	80 45.5	N38 46.8
Zuben'ubi	137 15.8	S16 02.8

	A.H.S.	Pas. Mer.
	° ′	h m
Venus	354 21.0	11 50
Marte	100 55.4	4 46
Júpiter	294 27.5	15 50
Saturno	304 15.6	15 11

T.U.	SOL			LUNA					
	A.H.G.		Dec.	A.H.G.	v	Dec.	d	P.H.	
d h	° ′		° ′	° ′	′	° ′	′	′	
29 00	178 46.8	N	3 19.0	132 52.7	10.7	N15 31.4	9.7	57.1	
01	193 47.0		20.0	147 22.4	10.7	15 41.1	9.6	57.1	
02	208 47.2		21.0	161 52.1	10.5	15 50.7	9.6	57.1	
03	223 47.4	. .	21.9	176 21.6	10.5	16 00.3	9.4	57.2	
04	238 47.6		22.9	190 51.1	10.5	16 09.7	9.4	57.2	
05	253 47.8		23.9	205 20.6	10.3	16 19.1	9.4	57.2	
06	268 48.0	N	3 24.9	219 49.9	10.3	N16 28.5	9.2	57.2	
07	283 48.2		25.8	234 19.2	10.2	16 37.7	9.2	57.3	
J 08	298 48.4		26.8	248 48.4	10.1	16 46.9	9.0	57.3	
U 09	313 48.5	. .	27.8	263 17.5	10.1	16 55.9	9.0	57.3	
E 10	328 48.7		28.8	277 46.6	9.9	17 04.9	8.9	57.3	
V 11	343 48.9		29.7	292 15.5	9.9	17 13.8	8.9	57.3	
12	358 49.1	N	3 30.7	306 44.4	9.9	N17 22.7	8.7	57.4	
E 13	13 49.3		31.7	321 13.3	9.7	17 31.4	8.6	57.4	
14	28 49.5		32.6	335 42.0	9.7	17 40.0	8.6	57.4	
S 15	43 49.7	. .	33.6	350 10.7	9.6	17 48.6	8.5	57.4	
16	58 49.9		34.6	4 39.3	9.5	17 57.1	8.3	57.5	
17	73 50.0		35.6	19 07.8	9.4	18 05.4	8.3	57.5	
18	88 50.2	N	3 36.5	33 36.2	9.4	N18 13.7	8.2	57.5	
19	103 50.4		37.5	48 04.6	9.3	18 21.9	8.1	57.5	
20	118 50.6		38.5	62 32.9	9.2	18 30.0	8.0	57.5	
21	133 50.8	. .	39.5	77 01.1	9.1	18 38.0	7.9	57.6	
22	148 51.0		40.4	91 29.2	9.0	18 45.9	7.8	57.6	
23	163 51.2		41.4	105 57.2	9.0	18 53.7	7.7	57.6	
30 00	178 51.4	N	3 42.4	120 25.2	8.9	N19 01.4	7.6	57.6	
01	193 51.5		43.3	134 53.1	8.8	19 09.0	7.5	57.6	
02	208 51.7		44.3	149 20.9	8.8	19 16.5	7.3	57.7	
03	223 51.9	. .	45.3	163 48.7	8.6	19 23.8	7.3	57.7	
04	238 52.1		46.3	178 16.3	8.6	19 31.1	7.2	57.7	
05	253 52.3		47.2	192 43.9	8.6	19 38.3	7.1	57.7	
06	268 52.5	N	3 48.2	207 11.5	8.4	N19 45.4	6.9	57.8	
07	283 52.7		49.2	221 38.9	8.4	19 52.3	6.9	57.8	
V 08	298 52.9		50.1	236 06.3	8.3	19 59.2	6.7	57.8	
I 09	313 53.0	. .	51.1	250 33.6	8.2	20 05.9	6.7	57.8	
E 10	328 53.2		52.1	265 00.8	8.1	20 12.6	6.5	57.8	
R 11	343 53.4		53.0	279 27.9	8.1	20 19.1	6.4	57.9	
12	358 53.6	N	3 54.0	293 55.0	8.0	N20 25.5	6.3	57.9	
N 13	13 53.8		55.0	308 22.0	7.9	20 31.8	6.2	57.9	
E 14	28 54.0		56.0	322 48.9	7.8	20 38.0	6.0	57.9	
S 15	43 54.2	. .	56.9	337 15.7	7.8	20 44.0	6.0	58.0	
16	58 54.4		57.9	351 42.5	7.7	20 50.0	5.8	58.0	
17	73 54.5		58.9	6 09.2	7.7	20 55.8	5.7	58.0	
18	88 54.7	N	3 59.8	20 35.9	7.5	N21 01.5	5.6	58.0	
19	103 54.9		4 00.8	35 02.4	7.5	21 07.1	5.4	58.0	
20	118 55.1		01.8	49 28.9	7.4	21 12.5	5.3	58.1	
21	133 55.3	. .	02.7	63 55.3	7.4	21 17.8	5.3	58.1	
22	148 55.5		03.7	78 21.7	7.3	21 23.1	5.0	58.1	
23	163 55.7		04.7	92 48.0	7.2	21 28.1	5.0	58.1	
31 00	178 55.9	N	4 05.7	107 14.2	7.2	N21 33.1	4.8	58.2	
01	193 56.0		06.6	121 40.4	7.1	21 37.9	4.7	58.2	
02	208 56.2		07.6	136 06.5	7.0	21 42.6	4.6	58.2	
03	223 56.4	. .	08.6	150 32.5	6.9	21 47.2	4.4	58.2	
04	238 56.6		09.5	164 58.4	6.9	21 51.6	4.4	58.2	
05	253 56.8		10.5	179 24.3	6.9	21 56.0	4.1	58.3	
06	268 57.0	N	4 11.5	193 50.2	6.7	N22 00.1	4.1	58.3	
S 07	283 57.2		12.4	208 15.9	6.8	22 04.2	3.9	58.3	
08	298 57.4		13.4	222 41.7	6.6	22 08.1	3.8	58.3	
A 09	313 57.5	. .	14.4	237 07.3	6.6	22 11.9	3.6	58.3	
10	328 57.7		15.3	251 32.9	6.5	22 15.5	3.5	58.4	
B 11	343 57.9		16.3	265 58.4	6.5	22 19.0	3.4	58.4	
12	358 58.1	N	4 17.3	280 23.9	6.4	N22 22.4	3.2	58.4	
A 13	13 58.3		18.2	294 49.3	6.4	22 25.6	3.1	58.4	
D 14	28 58.5		19.2	309 14.7	6.3	22 28.7	3.0	58.5	
15	43 58.7	. .	20.2	323 40.0	6.3	22 31.7	2.8	58.5	
O 16	58 58.9		21.1	338 05.3	6.2	22 34.5	2.7	58.5	
17	73 59.0		22.1	352 30.5	6.2	22 37.2	2.5	58.5	
18	88 59.2	N	4 23.1	6 55.7	6.1	N22 39.7	2.4	58.5	
19	103 59.4		24.0	21 20.8	6.0	22 42.1	2.3	58.6	
20	118 59.6		25.0	35 45.8	6.1	22 44.4	2.1	58.6	
21	133 59.8	. .	26.0	50 10.9	5.9	22 46.5	1.9	58.6	
22	149 00.0		26.9	64 35.8	6.0	22 48.4	1.8	58.6	
23	164 00.2		27.9	79 00.8	5.9	N22 50.2	1.7	58.7	
	SD 16.0	d	1.0	SD	15.6	15.8		15.9	

Lat.	Crepúsculo Náutico	Crepúsculo Civil	Orto Sol	Orto Luna 29	Orto Luna 30	Orto Luna 31	Orto Luna 1
°	h m	h m	h m	h m	h m	h m	h m
N 72	02 00	03 53	05 06	05 05	▭	▭	▭
N 70	02 36	04 08	05 13	05 46	05 02	▭	▭
68	03 01	04 19	05 18	06 14	06 03	05 33	▭
66	03 19	04 29	05 22	06 36	06 39	06 48	07 19
64	03 34	04 37	05 26	06 53	07 04	07 25	08 06
62	03 46	04 43	05 29	07 07	07 24	07 51	08 37
60	03 56	04 49	05 31	07 20	07 41	08 12	09 00
N 58	04 05	04 54	05 34	07 30	07 54	08 29	09 19
56	04 12	04 58	05 36	07 39	08 06	08 43	09 34
54	04 19	05 02	05 38	07 47	08 17	08 56	09 48
52	04 24	05 05	05 40	07 55	08 26	09 07	09 59
50	04 29	05 09	05 41	08 01	08 35	09 17	10 10
45	04 40	05 15	05 45	08 16	08 53	09 37	10 32
N 40	04 48	05 20	05 47	08 28	09 07	09 54	10 49
35	04 55	05 24	05 50	08 38	09 20	10 08	11 04
30	05 00	05 28	05 52	08 47	09 31	10 21	11 17
20	05 08	05 33	05 55	09 02	09 49	10 42	11 39
N 10	05 13	05 37	05 58	09 16	10 06	11 00	11 58
0	05 16	05 40	06 01	09 28	10 21	11 17	12 16
S 10	05 18	05 43	06 04	09 41	10 37	11 35	12 34
20	05 19	05 44	06 06	09 55	10 53	11 53	12 53
30	05 18	05 46	06 09	10 11	11 13	12 15	13 15
35	05 17	05 46	06 11	10 20	11 24	12 27	13 28
40	05 15	05 46	06 13	10 31	11 37	12 42	13 43
45	05 12	05 46	06 15	10 43	11 52	12 59	14 01
S 50	05 08	05 45	06 17	10 59	12 11	13 21	14 23
52	05 06	05 45	06 19	11 06	12 20	13 31	14 33
54	05 03	05 45	06 20	11 14	12 30	13 42	14 45
56	05 01	05 44	06 21	11 23	12 42	13 56	14 59
58	04 58	05 44	06 23	11 33	12 55	14 11	15 15
S 60	04 54	05 43	06 24	11 45	13 10	14 29	15 34

Lat.	Ocaso Sol	Crepúsculo Civil	Crepúsculo Náutico	Ocaso Luna 29	Ocaso Luna 30	Ocaso Luna 31	Ocaso Luna 1
°	h m	h m	h m	h m	h m	h m	h m
N 72	19 05	20 20	22 17	01 07	▭	▭	▭
N 70	18 59	20 04	21 38	00 27	03 00	▭	▭
68	18 53	19 52	21 12	00 00	01 59	04 25	▭
66	18 49	19 43	20 53	25 25	01 25	03 11	04 41
64	18 45	19 34	20 38	25 00	01 00	02 34	03 54
62	18 42	19 28	20 25	24 41	00 41	02 08	03 23
60	18 39	19 22	20 15	24 25	00 25	01 48	03 00
N 58	18 36	19 17	20 06	24 12	00 12	01 31	02 41
56	18 34	19 12	19 58	24 00	00 00	01 17	02 26
54	18 32	19 08	19 52	23 50	25 05	01 05	02 13
52	18 30	19 05	19 46	23 41	24 54	00 54	02 01
50	18 29	19 01	19 41	23 33	24 44	00 44	01 50
45	18 25	18 55	19 30	23 16	24 24	00 24	01 29
N 40	18 22	18 49	19 22	23 02	24 08	00 08	01 11
35	18 20	18 45	19 15	22 51	23 54	24 56	00 56
30	18 17	18 42	19 10	22 40	23 42	24 44	00 44
20	18 14	18 36	19 02	22 23	23 22	24 22	00 22
N 10	18 11	18 32	18 56	22 08	23 04	24 03	00 03
0	18 08	18 28	18 52	21 53	22 48	23 45	24 44
S 10	18 05	18 26	18 50	21 39	22 31	23 27	24 26
20	18 02	18 24	18 50	21 24	22 14	23 08	24 08
30	17 59	18 23	18 51	21 07	21 53	22 46	23 46
35	17 57	18 22	18 52	20 57	21 42	22 34	23 33
40	17 55	18 22	18 54	20 45	21 28	22 19	23 18
45	17 53	18 22	18 56	20 32	21 12	22 01	23 00
S 50	17 50	18 23	19 00	20 15	20 52	21 39	22 38
52	17 49	18 23	19 02	20 08	20 43	21 29	22 28
54	17 48	18 23	19 04	19 59	20 33	21 17	22 16
56	17 47	18 24	19 07	19 50	20 21	21 04	22 02
58	17 45	18 24	19 10	19 39	20 07	20 48	21 46
S 60	17 43	18 25	19 13	19 26	19 51	20 30	21 27

Día	SOL E.T. (−) 00h	SOL E.T. (−) 12h	SOL Pas. Mer.	LUNA Pas. Mer. Sup.	LUNA Pas. Mer. Inf.	LUNA Edad	LUNA Fase
d	m s	m s	h m	h m	h m	d	%
29	04 53	04 44	12 05	15 41	03 15	04	20
30	04 35	04 26	12 04	16 34	04 07	05	29
31	04 17	04 08	12 04	17 31	05 02	06	40

(DOM., LUN., MAR.) 1, 2, 3 ABRIL DEL 2001

T.U.	ARIES	VENUS −4.1		MARTE −0.2		JUPITER −2.1		SATURNO +0.2	
d h	A.H.G.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.
	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
1 00	189 25.1	184 50.3	N10 30.0	289 32.7	S22 48.0	123 30.7	N21 06.7	133 28.3	N17 54.2
01	204 27.6	199 54.1	29.1	304 34.2	48.1	138 32.7	06.8	148 30.5	54.2
02	219 30.0	214 57.9	28.2	319 35.7	48.2	153 34.7	06.9	163 32.7	54.3
03	234 32.5	230 01.7 . .	27.3	334 37.2 . .	48.3	168 36.7 . .	06.9	178 34.9 . .	54.4
04	249 35.0	245 05.4	26.4	349 38.7	48.5	183 38.7	07.0	193 37.1	54.4
05	264 37.4	260 09.2	25.5	4 40.2	48.6	198 40.7	07.1	208 39.3	54.5
06	279 39.9	275 13.0	N10 24.6	19 41.6	S22 48.7	213 42.7	N21 07.2	223 41.5	N17 54.5
07	294 42.4	290 16.7	23.7	34 43.1	48.8	228 44.7	07.3	238 43.7	54.6
D 08	309 44.8	305 20.5	22.8	49 44.6	49.0	243 46.7	07.3	253 45.9	54.7
O 09	324 47.3	320 24.2 . .	21.9	64 46.1 . .	49.1	258 48.7 . .	07.4	268 48.2 . .	54.7
M 10	339 49.8	335 28.0	21.0	79 47.6	49.2	273 50.7	07.5	283 50.4	54.8
I 11	354 52.2	350 31.8	20.1	94 49.1	49.3	288 52.7	07.6	298 52.6	54.9
N 12	9 54.7	5 35.5	N10 19.2	109 50.6	S22 49.5	303 54.7	N21 07.6	313 54.8	N17 54.9
G 13	24 57.1	20 39.3	18.3	124 52.1	49.6	318 56.7	07.7	328 57.0	55.0
O 14	39 59.6	35 43.0	17.4	139 53.6	49.7	333 58.7	07.8	343 59.2	55.1
15	55 02.1	50 46.8 . .	16.5	154 55.0 . .	49.8	349 00.7 . .	07.9	359 01.4 . .	55.1
16	70 04.5	65 50.5	15.6	169 56.5	50.0	4 02.7	08.0	14 03.6	55.2
17	85 07.0	80 54.3	14.7	184 58.0	50.1	19 04.7	08.0	29 05.8	55.3
18	100 09.5	95 58.0	N10 13.7	199 59.5	S22 50.2	34 06.7	N21 08.1	44 08.0	N17 55.3
19	115 11.9	111 01.8	12.8	215 01.0	50.3	49 08.7	08.2	59 10.2	55.4
20	130 14.4	126 05.5	11.9	230 02.5	50.4	64 10.7	08.3	74 12.4	55.5
21	145 16.9	141 09.3 . .	11.0	245 04.0 . .	50.6	79 12.7 . .	08.4	89 14.6 . .	55.5
22	160 19.3	156 13.0	10.1	260 05.5	50.7	94 14.7	08.4	104 16.8	55.6
23	175 21.8	171 16.7	09.2	275 07.0	50.8	109 16.7	08.5	119 19.0	55.7
2 00	190 24.3	186 20.5	N10 08.3	290 08.5	S22 50.9	124 18.7	N21 08.6	134 21.2	N17 55.7
01	205 26.7	201 24.2	07.3	305 10.0	51.1	139 20.7	08.7	149 23.4	55.8
02	220 29.2	216 28.0	06.4	320 11.5	51.2	154 22.7	08.7	164 25.6	55.9
03	235 31.6	231 31.7 . .	05.5	335 13.0 . .	51.3	169 24.7 . .	08.8	179 27.8 . .	55.9
04	250 34.1	246 35.4	04.6	350 14.5	51.4	184 26.7	08.9	194 30.0	56.0
05	265 36.6	261 39.1	03.7	5 16.0	51.6	199 28.7	09.0	209 32.2	56.0
06	280 39.0	276 42.9	N10 02.7	20 17.5	S22 51.7	214 30.7	N21 09.1	224 34.4	N17 56.1
07	295 41.5	291 46.6	01.8	35 19.0	51.8	229 32.7	09.1	239 36.6	56.2
08	310 44.0	306 50.3	00.9	50 20.5	51.9	244 34.7	09.2	254 38.8	56.2
L 09	325 46.4	321 54.0	10 00.0	65 22.0 . .	52.0	259 36.7 . .	09.3	269 41.0 . .	56.3
U 10	340 48.9	336 57.8	9 59.0	80 23.5	52.2	274 38.7	09.4	284 43.2	56.4
11	355 51.4	352 01.5	58.1	95 25.0	52.3	289 40.7	09.4	299 45.4	56.4
N 12	10 53.8	7 05.2	N 9 57.2	110 26.5	S22 52.4	304 42.7	N21 09.5	314 47.6	N17 56.5
E 13	25 56.3	22 08.9	56.3	125 28.0	52.5	319 44.7	09.6	329 49.8	56.6
14	40 58.8	37 12.6	55.3	140 29.5	52.7	334 46.7	09.7	344 52.0	56.6
S 15	56 01.2	52 16.3 . .	54.4	155 31.0 . .	52.8	349 48.6 . .	09.8	359 54.2 . .	56.7
16	71 03.7	67 20.0	53.5	170 32.5	52.9	4 50.6	09.8	14 56.4	56.8
17	86 06.1	82 23.7	52.5	185 34.1	53.0	19 52.6	09.9	29 58.6	56.8
18	101 08.6	97 27.4	N 9 51.6	200 35.6	S22 53.1	34 54.6	N21 10.0	45 00.8	N17 56.9
19	116 11.1	112 31.1	50.7	215 37.1	53.3	49 56.6	10.1	60 03.0	57.0
20	131 13.5	127 34.8	49.8	230 38.6	53.4	64 58.6	10.1	75 05.2	57.0
21	146 16.0	142 38.5 . .	48.8	245 40.1 . .	53.5	80 00.6 . .	10.2	90 07.4 . .	57.1
22	161 18.5	157 42.2	47.9	260 41.6	53.6	95 02.6	10.3	105 09.6	57.2
23	176 20.9	172 45.9	47.0	275 43.1	53.8	110 04.6	10.4	120 11.8	57.2
3 00	191 23.4	187 49.6	N 9 46.0	290 44.6	S22 53.9	125 06.6	N21 10.5	135 14.0	N17 57.3
01	206 25.9	202 53.3	45.1	305 46.1	54.0	140 08.6	10.5	150 16.2	57.4
02	221 28.3	217 57.0	44.2	320 47.7	54.1	155 10.6	10.6	165 18.4	57.4
03	236 30.8	233 00.7 . .	43.2	335 49.2 . .	54.2	170 12.6 . .	10.7	180 20.6 . .	57.5
04	251 33.3	248 04.4	42.3	350 50.7	54.4	185 14.6	10.8	195 22.8	57.6
05	266 35.7	263 08.1	41.3	5 52.2	54.5	200 16.6	10.9	210 25.0	57.6
06	281 38.2	278 11.7	N 9 40.4	20 53.7	S22 54.6	215 18.5	N21 10.9	225 27.1	N17 57.7
07	296 40.6	293 15.4	39.5	35 55.2	54.7	230 20.5	11.0	240 29.3	57.7
M 08	311 43.1	308 19.1	38.5	50 56.8	54.8	245 22.5	11.1	255 31.5	57.8
A 09	326 45.6	323 22.8 . .	37.6	65 58.3 . .	55.0	260 24.5 . .	11.2	270 33.7 . .	57.9
R 10	341 48.0	338 26.4	36.7	80 59.8	55.1	275 26.5	11.2	285 35.9	57.9
11	356 50.5	353 30.1	35.7	96 01.3	55.2	290 28.5	11.3	300 38.1	58.0
T 12	11 53.0	8 33.8	N 9 34.8	111 02.8	S22 55.3	305 30.5	N21 11.4	315 40.3	N17 58.1
13	26 55.4	23 37.4	33.8	126 04.4	55.4	320 32.5	11.5	330 42.5	58.1
E 14	41 57.9	38 41.1	32.9	141 05.9	55.6	335 34.5	11.6	345 44.7	58.2
15	57 00.4	53 44.8 . .	32.0	156 07.4 . .	55.7	350 36.5 . .	11.6	0 46.9 . .	58.3
S 16	72 02.8	68 48.4	31.0	171 08.9	55.8	5 38.5	11.7	15 49.1	58.3
17	87 05.3	83 52.1	30.1	186 10.4	55.9	20 40.5	11.8	30 51.3	58.4
18	102 07.7	98 55.7	N 9 29.1	201 12.0	S22 56.0	35 42.4	N21 11.9	45 53.5	N17 58.5
19	117 10.2	113 59.4	28.2	216 13.5	56.2	50 44.4	11.9	60 55.7	58.5
20	132 12.7	129 03.0	27.2	231 15.0	56.3	65 46.4	12.0	75 57.9	58.6
21	147 15.1	144 06.7 . .	26.3	246 16.5 . .	56.4	80 48.4 . .	12.1	91 00.1 . .	58.7
22	162 17.6	159 10.3	25.4	261 18.1	56.5	95 50.4	12.2	106 02.3	58.7
23	177 20.1	174 13.9	24.4	276 19.6	56.6	110 52.4	12.3	121 04.5	58.8
Pas. Mer.	h m 11 16.5	*v* 3.7	*d* 0.9	*v* 1.5	*d* 0.1	*v* 2.0	*d* 0.1	*v* 2.2	*d* 0.1

ESTRELLAS

Nombre	A.H.S. ° ′	Dec. ° ′
Acamar	315 25.9	S40 18.3
Achernar	335 34.4	S57 14.1
Acrux	173 19.5	S63 06.3
Adhara	255 20.1	S28 58.7
Aldebaran	291 00.6	N16 30.6
Alioth	166 28.4	N55 57.2
Alkaid	153 05.9	N49 18.4
Al Na'ir	27 56.0	S46 57.3
Alnilam	275 56.2	S 1 12.2
Alphard	218 05.3	S 8 39.9
Alphecca	126 18.8	N26 42.5
Alpheratz	357 53.8	N29 05.6
Altair	62 17.7	N 8 52.1
Ankaa	353 25.5	S42 18.1
Antares	112 37.8	S26 26.0
Arcturus	146 04.2	N19 10.5
Atria	107 48.1	S69 01.5
Avior	234 21.8	S59 31.1
Bellatrix	278 42.4	N 6 20.9
Betelgeuse	271 11.8	N 7 24.3
Canopus	264 00.5	S52 42.1
Capella	280 48.8	N46 00.0
Deneb	49 38.2	N45 16.7
Denebola	182 43.1	N14 33.9
Diphda	349 05.8	S17 59.0
Dubhe	194 02.7	N61 44.8
Elnath	278 24.9	N28 36.5
Eltanin	90 50.5	N51 29.0
Enif	33 56.8	N 9 52.6
Fomalhaut	15 34.8	S29 37.1
Gacrux	172 11.1	S57 07.2
Gienah	176 01.9	S17 33.0
Hadar	149 01.0	S60 22.6
Hamal	328 11.9	N23 27.9
Kaus Aust.	83 56.5	S34 23.0
Kochab	137 18.5	N74 08.9
Markab	13 48.2	N15 12.4
Menkar	314 25.4	N 4 05.5
Menkent	148 18.6	S36 22.5
Miaplacidus	221 41.3	S69 43.6
Mirfak	308 54.5	N49 51.9
Nunki	76 10.2	S26 17.7
Peacock	53 34.5	S56 43.7
Pollux	243 39.4	N28 01.4
Procyon	245 09.7	N 5 13.2
Rasalhague	96 15.2	N12 33.4
Regulus	207 53.5	N11 57.7
Rigel	281 21.4	S 8 12.2
Rigil Kent.	140 04.5	S60 50.2
Sabik	102 23.4	S15 43.6
Schedar	349 52.1	N56 32.4
Shaula	96 34.8	S37 06.2
Sirius	258 42.2	S16 43.3
Spica	158 41.1	S11 10.1
Suhail	222 59.3	S43 26.5
Vega	80 45.4	N38 46.8
Zuben'ubi	137 15.8	S16 02.8

	A.H.S. ° ′	Pas. Mer. h m
Venus	355 56.2	11 32
Marte	99 44.2	4 39
Júpiter	293 54.4	15 41
Saturno	303 56.9	15 00

T.U.	SOL				LUNA					
	A.H.G.		Dec.		A.H.G.	v	Dec.	d	P.H.	
d h	° ′		° ′		° ′	′	° ′	′	′	
1 00	179 00.3	N	4 28.9		93 25.7	5.8	N22 51.9	1.5	58.7	
01	194 00.5		29.8		107 50.5	5.8	22 53.4	1.4	58.7	
02	209 00.7		30.8		122 15.3	5.8	22 54.8	1.2	58.7	
03	224 00.9	. .	31.8		136 40.1	5.7	22 56.0	1.1	58.7	
04	239 01.1		32.7		151 04.8	5.7	22 57.1	1.0	58.8	
05	254 01.3		33.7		165 29.5	5.7	22 58.1	0.7	58.8	
06	269 01.5	N	4 34.7		179 54.2	5.6	N22 58.8	0.7	58.8	
07	284 01.6		35.6		194 18.8	5.6	22 59.5	0.5	58.8	
08	299 01.8		36.6		208 43.4	5.5	23 00.0	0.3	58.8	
09	314 02.0	. .	37.5		223 07.9	5.6	23 00.3	0.2	58.9	
10	329 02.2		38.5		237 32.5	5.5	23 00.5	0.0	58.9	
11	344 02.4		39.5		251 57.0	5.5	23 00.5	0.1	58.9	
12	359 02.6	N	4 40.4		266 21.5	5.4	N23 00.4	0.3	58.9	
13	14 02.8		41.4		280 45.9	5.5	23 00.1	0.4	58.9	
14	29 02.9		42.4		295 10.4	5.4	22 59.7	0.5	59.0	
15	44 03.1	. .	43.3		309 34.8	5.4	22 59.2	0.8	59.0	
16	59 03.3		44.3		323 59.2	5.3	22 58.4	0.8	59.0	
17	74 03.5		45.3		338 23.5	5.4	22 57.6	1.1	59.0	
18	89 03.7	N	4 46.2		352 47.9	5.3	N22 56.5	1.1	59.0	
19	104 03.9		47.2		7 12.2	5.3	22 55.4	1.4	59.1	
20	119 04.1		48.1		21 36.5	5.4	22 54.0	1.5	59.1	
21	134 04.2	. .	49.1		36 00.9	5.3	22 52.5	1.6	59.1	
22	149 04.4		50.1		50 25.2	5.2	22 50.9	1.8	59.1	
23	164 04.6		51.0		64 49.4	5.3	22 49.1	1.9	59.1	
2 00	179 04.8	N	4 52.0		79 13.7	5.3	N22 47.2	2.1	59.2	
01	194 05.0		53.0		93 38.0	5.3	22 45.1	2.3	59.2	
02	209 05.2		53.9		108 02.3	5.2	22 42.8	2.4	59.2	
03	224 05.4	. .	54.9		122 26.5	5.3	22 40.4	2.5	59.2	
04	239 05.5		55.8		136 50.8	5.3	22 37.9	2.7	59.2	
05	254 05.7		56.8		151 15.1	5.2	22 35.2	2.9	59.3	
06	269 05.9	N	4 57.8		165 39.3	5.3	N22 32.3	3.0	59.3	
07	284 06.1		58.7		180 03.6	5.2	22 29.3	3.2	59.3	
08	299 06.3		4 59.7		194 27.8	5.3	22 26.1	3.3	59.3	
09	314 06.5		5 00.6		208 52.1	5.3	22 22.8	3.4	59.3	
10	329 06.7		01.6		223 16.4	5.3	22 19.4	3.7	59.4	
11	344 06.8		02.6		237 40.7	5.3	22 15.7	3.7	59.4	
12	359 07.0	N	5 03.5		252 05.0	5.3	N22 12.0	3.9	59.4	
13	14 07.2		04.5		266 29.3	5.3	22 08.1	4.1	59.4	
14	29 07.4		05.4		280 53.6	5.3	22 04.0	4.2	59.4	
15	44 07.6	. .	06.4		295 17.9	5.4	21 59.8	4.4	59.4	
16	59 07.8		07.4		309 42.3	5.3	21 55.4	4.5	59.5	
17	74 07.9		08.3		324 06.6	5.4	21 50.9	4.7	59.5	
18	89 08.1	N	5 09.3		338 31.0	5.4	N21 46.2	4.8	59.5	
19	104 08.3		10.2		352 55.4	5.4	21 41.4	5.0	59.5	
20	119 08.5		11.2		7 19.8	5.5	21 36.4	5.1	59.5	
21	134 08.7	. .	12.2		21 44.3	5.4	21 31.3	5.2	59.5	
22	149 08.9		13.1		36 08.7	5.5	21 26.1	5.4	59.6	
23	164 09.1		14.1		50 33.2	5.5	21 20.7	5.6	59.6	
3 00	179 09.2	N	5 15.0		64 57.7	5.5	N21 15.1	5.7	59.6	
01	194 09.4		16.0		79 22.2	5.6	21 09.4	5.8	59.6	
02	209 09.6		16.9		93 46.8	5.6	21 03.6	6.0	59.6	
03	224 09.8	. .	17.9		108 11.4	5.6	20 57.6	6.1	59.6	
04	239 10.0		18.9		122 36.0	5.7	20 51.5	6.3	59.7	
05	254 10.2		19.8		137 00.7	5.6	20 45.2	6.4	59.7	
06	269 10.3	N	5 20.8		151 25.3	5.8	N20 38.8	6.6	59.7	
07	284 10.5		21.7		165 50.1	5.7	20 32.2	6.6	59.7	
08	299 10.7		22.7		180 14.8	5.8	20 25.6	6.9	59.7	
09	314 10.9	. .	23.6		194 39.6	5.8	20 18.7	6.9	59.7	
10	329 11.1		24.6		209 04.4	5.9	20 11.8	7.1	59.7	
11	344 11.3		25.6		223 29.3	5.9	20 04.7	7.3	59.8	
12	359 11.4	N	5 26.5		237 54.2	5.9	N19 57.4	7.4	59.8	
13	14 11.6		27.5		252 19.1	6.0	19 50.0	7.5	59.8	
14	29 11.8		28.4		266 44.1	6.0	19 42.5	7.6	59.8	
15	44 12.0	. .	29.4		281 09.1	6.0	19 34.9	7.8	59.8	
16	59 12.2		30.3		295 34.1	6.1	19 27.1	7.9	59.8	
17	74 12.4		31.3		309 59.2	6.2	19 19.2	8.0	59.8	
18	89 12.5	N	5 32.2		324 24.4	6.1	N19 11.2	8.2	59.8	
19	104 12.7		33.2		338 49.5	6.3	19 03.0	8.3	59.9	
20	119 12.9		34.2		353 14.8	6.2	18 54.7	8.4	59.9	
21	134 13.1	. .	35.1		7 40.0	6.4	18 46.3	8.6	59.9	
22	149 13.3		36.1		22 05.4	6.3	18 37.7	8.7	59.9	
23	164 13.5		37.0		36 30.7	6.4	N18 29.0	8.8	59.9	
	SD 16.0		d 1.0		SD	16.1		16.2		16.3

DOMINGO — LUNES — MARTES

Lat.	Crepúsculo Náutico	Crepúsculo Civil	Orto Sol	Orto Luna 1	Orto Luna 2	Orto Luna 3	Orto Luna 4
°	h m	h m	h m	h m	h m	h m	h m
N 72	01 24	03 35	04 51	▭	▭	▭	10 38
N 70	02 13	03 52	04 58	▭	▭	▭	11 28
68	02 42	04 05	05 05	▭	▭	09 44	11 59
66	03 04	04 16	05 10	07 19	08 37	10 26	12 22
64	03 21	04 25	05 15	08 06	09 18	10 54	12 40
62	03 34	04 33	05 19	08 37	09 46	11 15	12 54
60	03 46	04 39	05 22	09 00	10 08	11 33	13 07
N 58	03 55	04 45	05 25	09 19	10 26	11 47	13 17
56	04 03	04 50	05 28	09 34	10 40	12 00	13 26
54	04 10	04 54	05 30	09 48	10 53	12 10	13 35
52	04 17	04 58	05 33	09 59	11 04	12 20	13 42
50	04 22	05 02	05 35	10 10	11 14	12 28	13 48
45	04 34	05 09	05 39	10 32	11 35	12 47	14 02
N 40	04 43	05 15	05 43	10 49	11 52	13 01	14 14
35	04 50	05 20	05 46	11 04	12 06	13 14	14 24
30	04 56	05 24	05 48	11 17	12 19	13 25	14 32
20	05 05	05 31	05 53	11 39	12 40	13 43	14 47
N 10	05 11	05 36	05 57	11 58	12 58	13 59	15 00
0	05 15	05 40	06 00	12 16	13 15	14 14	15 12
S 10	05 18	05 43	06 04	12 34	13 32	14 29	15 23
20	05 20	05 45	06 07	12 53	13 51	14 45	15 36
30	05 20	05 47	06 11	13 15	14 12	15 04	15 51
35	05 19	05 48	06 13	13 28	14 24	15 14	15 59
40	05 18	05 49	06 16	13 43	14 38	15 27	16 08
45	05 15	05 49	06 19	14 01	14 55	15 41	16 20
S 50	05 12	05 50	06 22	14 23	15 16	15 58	16 33
52	05 11	05 50	06 24	14 33	15 25	16 07	16 39
54	05 09	05 50	06 25	14 45	15 36	16 16	16 46
56	05 07	05 50	06 27	14 59	15 49	16 26	16 54
58	05 04	05 50	06 29	15 15	16 03	16 38	17 02
S 60	05 02	05 50	06 32	15 34	16 20	16 51	17 12

Lat.	Ocaso Sol	Crepúsculo Civil	Crepúsculo Náutico	Ocaso Luna 1	Ocaso Luna 2	Ocaso Luna 3	Ocaso Luna 4
°	h m	h m	h m	h m	h m	h m	h m
N 72	19 20	20 37	22 56	▭	▭	▭	07 34
N 70	19 11	20 19	22 01	▭	▭	▭	06 43
68	19 04	20 05	21 30	▭	▭	06 24	06 11
66	18 59	19 53	21 07	04 41	05 28	05 42	05 47
64	18 54	19 44	20 49	03 54	04 46	05 14	05 28
62	18 50	19 36	20 35	03 23	04 17	04 52	05 12
60	18 46	19 30	20 24	03 00	03 55	04 34	04 59
N 58	18 43	19 24	20 14	02 41	03 38	04 19	04 48
56	18 40	19 19	20 06	02 26	03 23	04 06	04 38
54	18 38	19 14	19 58	02 13	03 10	03 55	04 29
52	18 36	19 10	19 52	02 01	02 58	03 45	04 21
50	18 33	19 06	19 46	01 50	02 48	03 36	04 14
45	18 29	18 59	19 34	01 29	02 27	03 17	03 59
N 40	18 25	18 53	19 25	01 11	02 10	03 01	03 46
35	18 22	18 48	19 18	00 56	01 55	02 48	03 36
30	18 19	18 43	19 12	00 44	01 42	02 37	03 26
20	18 15	18 37	19 03	00 22	01 21	02 17	03 10
N 10	18 11	18 32	18 56	00 03	01 02	02 00	02 55
0	18 07	18 28	18 52	24 44	00 44	01 44	02 42
S 10	18 03	18 24	18 49	24 26	00 26	01 27	02 28
20	18 00	18 22	18 47	24 08	00 08	01 10	02 13
30	17 55	18 19	18 47	23 46	24 50	00 50	01 57
35	17 53	18 18	18 48	23 33	24 38	00 38	01 47
40	17 50	18 18	18 49	23 18	24 24	00 24	01 35
45	17 48	18 17	18 51	23 00	24 08	00 08	01 22
S 50	17 44	18 16	18 54	22 38	23 48	25 06	01 06
52	17 42	18 16	18 55	22 28	23 38	24 58	00 58
54	17 41	18 16	18 57	22 16	23 28	24 49	00 49
56	17 39	18 16	18 59	22 02	23 16	24 39	00 39
58	17 37	18 16	19 01	21 46	23 01	24 28	00 28
S 60	17 34	18 16	19 04	21 27	22 45	24 15	00 15

Día	SOL E. T. (−) 00h	SOL E. T. (−) 12h	SOL Pas. Mer.	LUNA Pas. Mer. Sup.	LUNA Mer. Inf.	LUNA Edad	LUNA Fase
d	m s	m s	h m	h m	h m	d	%
1	03 59	03 50	12 04	18 30	06 00	07	51
2	03 41	03 32	12 04	19 29	07 00	08	62
3	03 23	03 15	12 03	20 28	07 59	09	73

T.U.	ARIES	VENUS −4.1		MARTE −0.3		JUPITER −2.1		SATURNO +0.2	
	A.H.G.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
4 00	192 22.5	189 17.6	N 9 23.5	291 21.1	S22 56.8	125 54.4	N21 12.3	136 06.7	N17 58.9
01	207 25.0	204 21.2	22.5	306 22.7	56.9	140 56.4	12.4	151 08.9	58.9
02	222 27.5	219 24.8	21.6	321 24.2	57.0	155 58.4	12.5	166 11.1	59.0
03	237 29.9	234 28.5 . .	20.6	336 25.7 . .	57.1	171 00.3 . .	12.6	181 13.3 . .	59.1
04	252 32.4	249 32.1	19.7	351 27.2	57.2	186 02.3	12.7	196 15.5	59.1
05	267 34.9	264 35.7	18.7	6 28.8	57.4	201 04.3	12.7	211 17.7	59.2
06	282 37.3	279 39.4	N 9 17.8	21 30.3	S22 57.5	216 06.3	N21 12.8	226 19.9	N17 59.3
07	297 39.8	294 43.0	16.9	36 31.8	57.6	231 08.3	12.9	241 22.1	59.3
08	312 42.2	309 46.6	15.9	51 33.4	57.7	246 10.3	13.0	256 24.2	59.4
09	327 44.7	324 50.2 . .	15.0	66 34.9 . .	57.8	261 12.3 . .	13.0	271 26.4 . .	59.5
10	342 47.2	339 53.8	14.0	81 36.4	57.9	276 14.3	13.1	286 28.6	59.5
11	357 49.6	354 57.4	13.1	96 38.0	58.1	291 16.2	13.2	301 30.8	59.6
12	12 52.1	10 01.0	N 9 12.1	111 39.5	S22 58.2	306 18.2	N21 13.3	316 33.0	N17 59.7
13	27 54.6	25 04.7	11.2	126 41.1	58.3	321 20.2	13.4	331 35.2	59.7
14	42 57.0	40 08.3	10.2	141 42.6	58.4	336 22.2	13.4	346 37.4	59.8
15	57 59.5	55 11.9 . .	09.3	156 44.1 . .	58.5	351 24.2 . .	13.5	1 39.6 . .	59.9
16	73 02.0	70 15.5	08.3	171 45.7	58.7	6 26.2	13.6	16 41.8	17 59.9
17	88 04.4	85 19.1	07.4	186 47.2	58.8	21 28.2	13.7	31 44.0	18 00.0
18	103 06.9	100 22.6	N 9 06.4	201 48.7	S22 58.9	36 30.1	N21 13.7	46 46.2	N18 00.1
19	118 09.4	115 26.2	05.5	216 50.3	59.0	51 32.1	13.8	61 48.4	00.1
20	133 11.8	130 29.8	04.5	231 51.8	59.1	66 34.1	13.9	76 50.6	00.2
21	148 14.3	145 33.4 . .	03.6	246 53.4 . .	59.3	81 36.1 . .	14.0	91 52.8 . .	00.3
22	163 16.7	160 37.0	02.6	261 54.9	59.4	96 38.1	14.1	106 55.0	00.3
23	178 19.2	175 40.6	01.7	276 56.5	59.5	111 40.1	14.1	121 57.2	00.4
5 00	193 21.7	190 44.1	N 9 00.7	291 58.0	S22 59.6	126 42.1	N21 14.2	136 59.4	N18 00.4
01	208 24.1	205 47.7	8 59.8	306 59.5	59.7	141 44.0	14.3	152 01.5	00.5
02	223 26.6	220 51.3	58.8	322 01.1	22 59.8	156 46.0	14.4	167 03.7	00.6
03	238 29.1	235 54.9 . .	57.9	337 02.6	23 00.0	171 48.0 . .	14.4	182 05.9 . .	00.6
04	253 31.5	250 58.4	56.9	352 04.2	00.1	186 50.0	14.5	197 08.1	00.7
05	268 34.0	266 02.0	56.0	7 05.7	00.2	201 52.0	14.6	212 10.3	00.8
06	283 36.5	281 05.6	N 8 55.0	22 07.3	S23 00.3	216 54.0	N21 14.7	227 12.5	N18 00.8
07	298 38.9	296 09.1	54.1	37 08.8	00.4	231 55.9	14.8	242 14.7	00.9
08	313 41.4	311 12.7	53.1	52 10.4	00.5	246 57.9	14.8	257 16.9	01.0
09	328 43.8	326 16.2 . .	52.2	67 11.9 . .	00.7	261 59.9 . .	14.9	272 19.1 . .	01.0
10	343 46.3	341 19.8	51.2	82 13.5	00.8	277 01.9	15.0	287 21.3	01.1
11	358 48.8	356 23.3	50.3	97 15.0	00.9	292 03.9	15.1	302 23.5	01.2
12	13 51.2	11 26.9	N 8 49.3	112 16.6	S23 01.0	307 05.9	N21 15.2	317 25.7	N18 01.2
13	28 53.7	26 30.4	48.4	127 18.1	01.1	322 07.8	15.2	332 27.9	01.3
14	43 56.2	41 33.9	47.4	142 19.7	01.2	337 09.8	15.3	347 30.0	01.4
15	58 58.6	56 37.5 . .	46.5	157 21.2 . .	01.4	352 11.8 . .	15.4	2 32.2 . .	01.4
16	74 01.1	71 41.0	45.5	172 22.8	01.5	7 13.8	15.5	17 34.4	01.5
17	89 03.6	86 44.5	44.6	187 24.3	01.6	22 15.8	15.5	32 36.6	01.6
18	104 06.0	101 48.1	N 8 43.6	202 25.9	S23 01.7	37 17.8	N21 15.6	47 38.8	N18 01.6
19	119 08.5	116 51.6	42.7	217 27.5	01.8	52 19.7	15.7	62 41.0	01.7
20	134 11.0	131 55.1	41.7	232 29.0	01.9	67 21.7	15.8	77 43.2	01.8
21	149 13.4	146 58.6 . .	40.8	247 30.6 . .	02.1	82 23.7 . .	15.9	92 45.4 . .	01.8
22	164 15.9	162 02.1	39.8	262 32.1	02.2	97 25.7	15.9	107 47.6	01.9
23	179 18.3	177 05.7	38.9	277 33.7	02.3	112 27.7	16.0	122 49.8	02.0
6 00	194 20.8	192 09.2	N 8 37.9	292 35.3	S23 02.4	127 29.6	N21 16.1	137 52.0	N18 02.0
01	209 23.3	207 12.7	37.0	307 36.8	02.5	142 31.6	16.2	152 54.1	02.1
02	224 25.7	222 16.2	36.0	322 38.4	02.6	157 33.6	16.2	167 56.3	02.2
03	239 28.2	237 19.7 . .	35.1	337 39.9 . .	02.8	172 35.6 . .	16.3	182 58.5 . .	02.2
04	254 30.7	252 23.2	34.1	352 41.5	02.9	187 37.6	16.4	198 00.7	02.3
05	269 33.1	267 26.7	33.2	7 43.1	03.0	202 39.5	16.5	213 02.9	02.4
06	284 35.6	282 30.2	N 8 32.2	22 44.6	S23 03.1	217 41.5	N21 16.6	228 05.1	N18 02.4
07	299 38.1	297 33.7	31.3	37 46.2	03.2	232 43.5	16.6	243 07.3	02.5
08	314 40.5	312 37.1	30.4	52 47.8	03.3	247 45.5	16.7	258 09.5	02.6
09	329 43.0	327 40.6 . .	29.4	67 49.3 . .	03.5	262 47.5 . .	16.8	273 11.7 . .	02.6
10	344 45.4	342 44.1	28.5	82 50.9	03.6	277 49.4	16.9	288 13.9	02.7
11	359 47.9	357 47.6	27.5	97 52.5	03.7	292 51.4	17.0	303 16.1	02.8
12	14 50.4	12 51.0	N 8 26.6	112 54.0	S23 03.8	307 53.4	N21 17.0	318 18.2	N18 02.8
13	29 52.8	27 54.5	25.6	127 55.6	03.9	322 55.4	17.1	333 20.4	02.9
14	44 55.3	42 58.0	24.7	142 57.2	04.0	337 57.3	17.2	348 22.6	03.0
15	59 57.8	58 01.4 . .	23.7	157 58.7 . .	04.1	352 59.3 . .	17.3	3 24.8 . .	03.0
16	75 00.2	73 04.9	22.8	173 00.3	04.3	8 01.3	17.3	18 27.0	03.1
17	90 02.7	88 08.4	21.8	188 01.9	04.4	23 03.3	17.4	33 29.2	03.2
18	105 05.2	103 11.8	N 8 20.9	203 03.5	S23 04.5	38 05.3	N21 17.5	48 31.4	N18 03.2
19	120 07.6	118 15.3	19.9	218 05.0	04.6	53 07.2	17.6	63 33.6	03.3
20	135 10.1	133 18.7	19.0	233 06.6	04.7	68 09.2	17.7	78 35.8	03.4
21	150 12.6	148 22.2 . .	18.1	248 08.2 . .	04.8	83 11.2 . .	17.7	93 37.9 . .	03.4
22	165 15.0	163 25.6	17.1	263 09.8	05.0	98 13.2	17.8	108 40.1	03.5
23	180 17.5	178 29.0	16.2	278 11.3	05.1	113 15.1	17.9	123 42.3	03.6
Pas. Mer.	h m 11 04.7	v 3.5	d 0.9	v 1.6	d 0.1	v 2.0	d 0.1	v 2.2	d 0.1

ESTRELLAS		
Nombre	A.H.S.	Dec.
	° ′	° ′
Acamar	315 25.9	S40 18.3
Achernar	335 34.4	S57 14.0
Acrux	173 19.5	S63 06.4
Adhara	255 20.1	S28 58.7
Aldebaran	291 00.6	N16 30.6
Alioth	166 28.4	N55 57.2
Alkaid	153 05.9	N49 18.4
Al Na'ir	27 56.0	S46 57.3
Alnilam	275 56.2	S 1 12.2
Alphard	218 05.3	S 8 39.9
Alphecca	126 18.8	N26 42.5
Alpheratz	357 53.8	N29 05.6
Altair	62 17.6	N 8 52.1
Ankaa	353 25.5	S42 18.1
Antares	112 37.8	S26 26.0
Arcturus	146 04.1	N19 10.5
Atria	107 48.1	S69 01.5
Avior	234 21.8	S59 31.1
Bellatrix	278 42.4	N 6 20.9
Betelgeuse	271 11.8	N 7 24.3
Canopus	264 00.5	S52 42.1
Capella	280 48.8	N46 00.0
Deneb	49 38.2	N45 16.7
Denebola	182 43.1	N14 33.9
Diphda	349 05.8	S17 59.0
Dubhe	194 02.7	N61 44.8
Elnath	278 24.9	N28 36.5
Eltanin	90 50.4	N51 29.0
Enif	33 56.7	N 9 52.6
Fomalhaut	15 34.8	S29 37.1
Gacrux	172 11.1	S57 07.2
Gienah	176 01.9	S17 33.0
Hadar	149 01.0	S60 22.6
Hamal	328 11.9	N23 27.9
Kaus Aust.	83 56.4	S34 23.0
Kochab	137 18.5	N74 08.9
Markab	13 48.2	N15 12.4
Menkar	314 25.4	N 4 05.5
Menkent	148 18.6	S36 22.5
Miaplacidus	221 41.3	S69 43.6
Mirfak	308 54.6	N49 51.9
Nunki	76 10.2	S26 17.7
Peacock	53 34.4	S56 43.7
Pollux	243 39.4	N28 01.4
Procyon	245 09.7	N 5 13.2
Rasalhague	96 15.2	N12 33.4
Regulus	207 53.5	N11 57.7
Rigel	281 21.4	S 8 12.2
Rigil Kent.	140 04.4	S60 50.3
Sabik	102 23.4	S15 43.6
Schedar	349 52.1	N56 32.4
Shaula	96 34.8	S37 06.2
Sirius	258 42.2	S16 43.3
Spica	158 41.1	S11 10.1
Suhail	222 59.3	S43 26.5
Vega	80 45.4	N38 46.8
Zuben'ubi	137 15.8	S16 02.8

	A.H.S.	Pas. Mer.
	° ′	h m
Venus	357 22.5	11 14
Marte	98 36.3	4 32
Júpiter	293 20.4	15 31
Saturno	303 37.7	14 50

MIERCOLES JUEVES VIERNES

T.U.	SOL				LUNA					
	A.H.G.		Dec.		A.H.G.	v	Dec.	d	P.H.	
d h	° ′		° ′		° ′	′	° ′	′	′	
4 00	179 13.6	N	5 38.0		50 56.1	6.5	N18 20.2	8.9	59.9	
01	194 13.8		38.9		65 21.6	6.5	18 11.3	9.0	59.9	
02	209 14.0		39.9		79 47.1	6.6	18 02.3	9.2	59.9	
03	224 14.2	. .	40.8		94 12.7	6.6	17 53.1	9.3	59.9	
04	239 14.4		41.8		108 38.3	6.6	17 43.8	9.4	60.0	
05	254 14.6		42.7		123 03.9	6.7	17 34.4	9.5	60.0	
06	269 14.7	N	5 43.7		137 29.6	6.8	N17 24.9	9.7	60.0	
M 07	284 14.9		44.6		151 55.4	6.8	17 15.2	9.7	60.0	
I 08	299 15.1		45.6		166 21.2	6.9	17 05.5	9.9	60.0	
E 09	314 15.3	. .	46.6		180 47.1	6.9	16 55.6	10.0	60.0	
R 10	329 15.5		47.5		195 13.0	6.9	16 45.6	10.0	60.0	
C 11	344 15.7		48.5		209 38.9	7.1	16 35.6	10.2	60.0	
12	359 15.8	N	5 49.4		224 05.0	7.0	N16 25.4	10.3	60.0	
O 13	14 16.0		50.4		238 31.0	7.1	16 15.1	10.5	60.0	
L 14	29 16.2		51.3		252 57.1	7.2	16 04.6	10.5	60.0	
E 15	44 16.4	. .	52.3		267 23.3	7.2	15 54.1	10.6	60.0	
S 16	59 16.6		53.2		281 49.5	7.3	15 43.5	10.7	60.1	
17	74 16.7		54.2		296 15.8	7.4	15 32.8	10.9	60.1	
18	89 16.9	N	5 55.1		310 42.2	7.3	N15 21.9	10.9	60.1	
19	104 17.1		56.1		325 08.5	7.5	15 11.0	11.0	60.1	
20	119 17.3		57.0		339 35.0	7.5	15 00.0	11.1	60.1	
21	134 17.5	. .	58.0		354 01.5	7.5	14 48.9	11.2	60.1	
22	149 17.6		58.9		8 28.0	7.6	14 37.7	11.4	60.1	
23	164 17.8		5 59.9		22 54.6	7.7	14 26.3	11.4	60.1	
5 00	179 18.0	N	6 00.8		37 21.3	7.7	N14 14.9	11.5	60.1	
01	194 18.2		01.8		51 48.0	7.8	14 03.4	11.5	60.1	
02	209 18.4		02.7		66 14.8	7.8	13 51.9	11.7	60.1	
03	224 18.6	. .	03.7		80 41.6	7.9	13 40.2	11.8	60.1	
04	239 18.7		04.6		95 08.5	7.9	13 28.4	11.8	60.1	
05	254 18.9		05.6		109 35.4	8.0	13 16.6	12.0	60.1	
06	269 19.1	N	6 06.5		124 02.4	8.0	N13 04.6	12.0	60.1	
07	284 19.3		07.5		138 29.4	8.1	12 52.6	12.1	60.1	
J 08	299 19.5		08.4		152 56.5	8.1	12 40.5	12.1	60.1	
U 09	314 19.6	. .	09.4		167 23.6	8.2	12 28.4	12.3	60.1	
10	329 19.8		10.3		181 50.8	8.3	12 16.1	12.3	60.1	
E 11	344 20.0		11.3		196 18.1	8.3	12 03.8	12.4	60.1	
12	359 20.2	N	6 12.2		210 45.4	8.3	N11 51.4	12.5	60.1	
V 13	14 20.4		13.1		225 12.7	8.4	11 38.9	12.5	60.1	
E 14	29 20.5		14.1		239 40.1	8.5	11 26.4	12.7	60.1	
S 15	44 20.7	. .	15.0		254 07.6	8.5	11 13.7	12.6	60.1	
16	59 20.9		16.0		268 35.1	8.5	11 01.1	12.8	60.1	
17	74 21.1		16.9		283 02.6	8.6	10 48.3	12.8	60.1	
18	89 21.3	N	6 17.9		297 30.2	8.7	N10 35.5	12.9	60.1	
19	104 21.4		18.8		311 57.9	8.7	10 22.6	12.9	60.1	
20	119 21.6		19.8		326 25.6	8.8	10 09.7	13.0	60.1	
21	134 21.8	. .	20.7		340 53.4	8.8	9 56.7	13.1	60.1	
22	149 22.0		21.7		355 21.2	8.8	9 43.6	13.1	60.1	
23	164 22.2		22.6		9 49.0	8.9	9 30.5	13.2	60.1	
6 00	179 22.3	N	6 23.6		24 16.9	9.0	N 9 17.3	13.2	60.1	
01	194 22.5		24.5		38 44.9	8.9	9 04.1	13.3	60.1	
02	209 22.7		25.4		53 12.8	9.1	8 50.8	13.3	60.1	
03	224 22.9	. .	26.4		67 40.9	9.1	8 37.5	13.4	60.1	
04	239 23.1		27.3		82 09.0	9.1	8 24.1	13.5	60.0	
05	254 23.2		28.3		96 37.1	9.2	8 10.6	13.4	60.0	
06	269 23.4	N	6 29.2		111 05.3	9.2	N 7 57.2	13.6	60.0	
07	284 23.6		30.2		125 33.5	9.2	7 43.6	13.5	60.0	
08	299 23.8		31.1		140 01.7	9.4	7 30.1	13.6	60.0	
V 09	314 23.9	. .	32.1		154 30.1	9.3	7 16.5	13.7	60.0	
I 10	329 24.1		33.0		168 58.4	9.4	7 02.8	13.7	60.0	
E 11	344 24.3		33.9		183 26.8	9.4	6 49.1	13.7	60.0	
R 12	359 24.5	N	6 34.9		197 55.2	9.5	N 6 35.4	13.7	60.0	
N 13	14 24.7		35.8		212 23.7	9.5	6 21.7	13.8	60.0	
E 14	29 24.8		36.8		226 52.2	9.6	6 07.9	13.8	60.0	
S 15	44 25.0	. .	37.7		241 20.8	9.5	5 54.1	13.9	60.0	
16	59 25.2		38.6		255 49.3	9.7	5 40.2	13.9	59.9	
17	74 25.4		39.6		270 18.0	9.6	5 26.3	13.9	59.9	
18	89 25.5	N	6 40.5		284 46.6	9.7	N 5 12.4	13.9	59.9	
19	104 25.7		41.5		299 15.3	9.8	4 58.5	14.0	59.9	
20	119 25.9		42.4		313 44.1	9.8	4 44.5	14.0	59.9	
21	134 26.1	. .	43.4		328 12.9	9.8	4 30.5	14.0	59.9	
22	149 26.3		44.3		342 41.7	9.8	4 16.5	14.0	59.9	
23	164 26.4		45.2		357 10.5	9.9	N 4 02.5	14.0	59.9	
	SD 16.0		d 0.9		SD 16.4		16.4		16.3	

Lat.	Crepúsculo Náutico	Crepúsculo Civil	Orto Sol	Orto Luna 4	Orto Luna 5	Orto Luna 6	Orto Luna 7
°	h m	h m	h m	h m	h m	h m	h m
N 72	////	03 15	04 35	10 38	13 27	15 47	17 57
N 70	01 45	03 35	04 44	11 28	13 47	15 55	17 57
68	02 22	03 51	04 52	11 59	14 03	16 02	17 56
66	02 48	04 03	04 59	12 22	14 16	16 07	17 55
64	03 07	04 14	05 04	12 40	14 27	16 12	17 55
62	03 22	04 22	05 09	12 54	14 36	16 16	17 55
60	03 35	04 30	05 13	13 07	14 43	16 20	17 54
N 58	03 45	04 36	05 17	13 17	14 50	16 23	17 54
56	03 54	04 42	05 20	13 26	14 56	16 25	17 54
54	04 02	04 47	05 23	13 35	15 01	16 28	17 53
52	04 09	04 51	05 26	13 42	15 06	16 30	17 53
50	04 15	04 55	05 28	13 48	15 10	16 32	17 53
45	04 28	05 04	05 33	14 02	15 20	16 37	17 53
N 40	04 38	05 10	05 38	14 14	15 27	16 40	17 52
35	04 46	05 16	05 41	14 24	15 34	16 44	17 52
30	04 52	05 21	05 45	14 32	15 40	16 46	17 52
20	05 02	05 28	05 50	14 47	15 50	16 51	17 51
N 10	05 09	05 34	05 55	15 00	15 58	16 55	17 51
0	05 14	05 39	05 59	15 12	16 07	16 59	17 51
S 10	05 18	05 43	06 04	15 23	16 15	17 03	17 50
20	05 20	05 46	06 08	15 36	16 23	17 08	17 50
30	05 21	05 49	06 13	15 51	16 33	17 12	17 50
35	05 21	05 50	06 16	15 59	16 39	17 15	17 50
40	05 20	05 52	06 19	16 08	16 45	17 18	17 50
45	05 19	05 53	06 23	16 20	16 53	17 22	17 49
S 50	05 17	05 54	06 27	16 33	17 02	17 26	17 49
52	05 16	05 55	06 29	16 39	17 06	17 28	17 49
54	05 15	05 55	06 31	16 46	17 10	17 30	17 49
56	05 13	05 56	06 33	16 54	17 15	17 33	17 49
58	05 11	05 57	06 36	17 02	17 21	17 35	17 49
S 60	05 09	05 57	06 39	17 12	17 27	17 38	17 49

Lat.	Ocaso Sol	Crepúsculo Civil	Crepúsculo Náutico	Ocaso Luna 4	Ocaso Luna 5	Ocaso Luna 6	Ocaso Luna 7
°	h m	h m	h m	h m	h m	h m	h m
N 72	19 34	20 55	////	07 34	06 42	06 15	05 53
N 70	19 24	20 34	22 29	06 43	06 20	06 04	05 50
68	19 16	20 18	21 49	06 11	06 02	05 55	05 48
66	19 09	20 05	21 22	05 47	05 48	05 47	05 46
64	19 03	19 54	21 02	05 28	05 36	05 41	05 44
62	18 58	19 45	20 46	05 12	05 26	05 35	05 42
60	18 54	19 37	20 33	04 59	05 17	05 30	05 41
N 58	18 50	19 31	20 22	04 48	05 09	05 26	05 40
56	18 46	19 25	20 13	04 38	05 02	05 22	05 39
54	18 43	19 20	20 05	04 29	04 56	05 18	05 38
52	18 41	19 15	19 58	04 21	04 51	05 15	05 37
50	18 38	19 11	19 51	04 14	04 46	05 12	05 36
45	18 33	19 03	19 39	03 59	04 35	05 06	05 34
N 40	18 28	18 56	19 28	03 46	04 26	05 00	05 32
35	18 24	18 50	19 20	03 36	04 18	04 56	05 31
30	18 21	18 45	19 14	03 26	04 11	04 52	05 30
20	18 15	18 38	19 04	03 10	03 59	04 44	05 28
N 10	18 10	18 32	18 56	02 55	03 48	04 38	05 26
0	18 06	18 27	18 51	02 42	03 38	04 32	05 24
S 10	18 02	18 23	18 47	02 28	03 28	04 26	05 22
20	17 57	18 19	18 45	02 13	03 17	04 19	05 20
30	17 52	18 16	18 44	01 57	03 04	04 12	05 18
35	17 49	18 14	18 44	01 47	02 57	04 07	05 16
40	17 46	18 13	18 44	01 35	02 49	04 02	05 15
45	17 42	18 11	18 45	01 22	02 39	03 56	05 13
S 50	17 38	18 10	18 47	01 06	02 27	03 49	05 11
52	17 36	18 09	18 48	00 58	02 21	03 46	05 10
54	17 33	18 09	18 50	00 49	02 15	03 42	05 09
56	17 31	18 08	18 51	00 39	02 08	03 38	05 07
58	17 28	18 08	18 53	00 28	02 01	03 34	05 06
S 60	17 25	18 07	18 55	00 15	01 52	03 29	05 04

Día	SOL E.T. (−) 00h	SOL E.T. (−) 12h	SOL Pas. Mer.	LUNA Pas. Sup.	LUNA Mer. Inf.	LUNA Edad	LUNA Fase
d	m s	m s	h m	h m	h m	d	%
4	03 06	02 57	12 03	21 25	08 57	10	82
5	02 48	02 40	12 03	22 19	09 52	11	90
6	02 31	02 22	12 02	23 12	10 46	12	96

T.U.	ARIES	VENUS −4.3		MARTE −0.5		JUPITER −2.1		SATURNO +0.2	
	A.H.G.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
10 00	198 17.4	197 30.9	N 7 08.8	295 08.3	S23 13.3	130 39.0	N21 23.6	141 21.8	N18 08.4
01	213 19.8	212 34.1	07.9	310 09.9	13.4	145 40.9	23.7	156 24.0	08.5
02	228 22.3	227 37.3	07.0	325 11.6	13.5	160 42.9	23.7	171 26.2	08.6
03	243 24.7	242 40.5	06.1	340 13.2	13.7	175 44.8	23.8	186 28.4	08.6
04	258 27.2	257 43.7	05.2	355 14.8	13.8	190 46.8	23.9	201 30.5	08.7
05	273 29.7	272 46.8	04.4	10 16.5	13.9	205 48.8	24.0	216 32.7	08.8
06	288 32.1	287 50.0	N 7 03.5	25 18.1	S23 14.0	220 50.7	N21 24.0	231 34.9	N18 08.8
07	303 34.6	302 53.1	02.6	40 19.7	14.1	235 52.7	24.1	246 37.1	08.9
08	318 37.1	317 56.3	01.7	55 21.4	14.2	250 54.7	24.2	261 39.3	09.0
09	333 39.5	332 59.5	7 00.8	70 23.0	14.3	265 56.6	24.3	276 41.4	09.0
10	348 42.0	348 02.6	6 59.9	85 24.7	14.4	280 58.6	24.4	291 43.6	09.1
11	3 44.5	3 05.7	59.0	100 26.3	14.5	296 00.5	24.4	306 45.8	09.2
12	18 46.9	18 08.9	N 6 58.2	115 27.9	S23 14.7	311 02.5	N21 24.5	321 48.0	N18 09.2
13	33 49.4	33 12.0	57.3	130 29.6	14.8	326 04.5	24.6	336 50.2	09.3
14	48 51.9	48 15.2	56.4	145 31.2	14.9	341 06.4	24.7	351 52.3	09.4
15	63 54.3	63 18.3	55.5	160 32.8	15.0	356 08.4	24.7	6 54.5	09.4
16	78 56.8	78 21.4	54.6	175 34.5	15.1	11 10.4	24.8	21 56.7	09.5
17	93 59.2	93 24.5	53.8	190 36.1	15.2	26 12.3	24.9	36 58.9	09.6
18	109 01.7	108 27.7	N 6 52.9	205 37.8	S23 15.3	41 14.3	N21 25.0	52 01.1	N18 09.6
19	124 04.2	123 30.8	52.0	220 39.4	15.4	56 16.2	25.1	67 03.2	09.7
20	139 06.6	138 33.9	51.1	235 41.1	15.5	71 18.2	25.1	82 05.4	09.8
21	154 09.1	153 37.0	50.3	250 42.7	15.6	86 20.2	25.2	97 07.6	09.8
22	169 11.6	168 40.1	49.4	265 44.4	15.8	101 22.1	25.3	112 09.8	09.9
23	184 14.0	183 43.2	48.5	280 46.0	15.9	116 24.1	25.4	127 12.0	10.0
11 00	199 16.5	198 46.3	N 6 47.6	295 47.6	S23 16.0	131 26.0	N21 25.4	142 14.1	N18 10.0
01	214 19.0	213 49.4	46.8	310 49.3	16.1	146 28.0	25.5	157 16.3	10.1
02	229 21.4	228 52.5	45.9	325 50.9	16.2	161 30.0	25.6	172 18.5	10.2
03	244 23.9	243 55.5	45.0	340 52.6	16.3	176 31.9	25.7	187 20.7	10.2
04	259 26.4	258 58.6	44.2	355 54.2	16.4	191 33.9	25.8	202 22.9	10.3
05	274 28.8	274 01.7	43.3	10 55.9	16.5	206 35.8	25.8	217 25.0	10.4
06	289 31.3	289 04.8	N 6 42.4	25 57.6	S23 16.6	221 37.8	N21 25.9	232 27.2	N18 10.4
07	304 33.7	304 07.8	41.6	40 59.2	16.8	236 39.8	26.0	247 29.4	10.5
08	319 36.2	319 10.9	40.7	56 00.9	16.9	251 41.7	26.1	262 31.6	10.6
09	334 38.7	334 14.0	39.9	71 02.5	17.0	266 43.7	26.1	277 33.7	10.6
10	349 41.1	349 17.0	39.0	86 04.2	17.1	281 45.6	26.2	292 35.9	10.7
11	4 43.6	4 20.1	38.1	101 05.8	17.2	296 47.6	26.3	307 38.1	10.8
12	19 46.1	19 23.1	N 6 37.3	116 07.5	S23 17.3	311 49.6	N21 26.4	322 40.3	N18 10.8
13	34 48.5	34 26.2	36.4	131 09.1	17.4	326 51.5	26.5	337 42.5	10.9
14	49 51.0	49 29.2	35.6	146 10.8	17.5	341 53.5	26.5	352 44.6	11.0
15	64 53.5	64 32.3	34.7	161 12.5	17.6	356 55.4	26.6	7 46.8	11.1
16	79 55.9	79 35.3	33.9	176 14.1	17.7	11 57.4	26.7	22 49.0	11.1
17	94 58.4	94 38.3	33.0	191 15.8	17.9	26 59.3	26.8	37 51.2	11.2
18	110 00.8	109 41.3	N 6 32.2	206 17.4	S23 18.0	42 01.3	N21 26.8	52 53.3	N18 11.3
19	125 03.3	124 44.4	31.3	221 19.1	18.1	57 03.3	26.9	67 55.5	11.3
20	140 05.8	139 47.4	30.5	236 20.8	18.2	72 05.2	27.0	82 57.7	11.4
21	155 08.2	154 50.4	29.6	251 22.4	18.3	87 07.2	27.1	97 59.9	11.5
22	170 10.7	169 53.4	28.8	266 24.1	18.4	102 09.1	27.2	113 02.1	11.5
23	185 13.2	184 56.4	27.9	281 25.8	18.5	117 11.1	27.2	128 04.2	11.6
12 00	200 15.6	199 59.4	N 6 27.1	296 27.4	S23 18.6	132 13.0	N21 27.3	143 06.4	N18 11.7
01	215 18.1	215 02.4	26.3	311 29.1	18.7	147 15.0	27.4	158 08.6	11.7
02	230 20.6	230 05.4	25.4	326 30.8	18.8	162 17.0	27.5	173 10.8	11.8
03	245 23.0	245 08.4	24.6	341 32.4	18.9	177 18.9	27.5	188 12.9	11.9
04	260 25.5	260 11.4	23.7	356 34.1	19.1	192 20.9	27.6	203 15.1	11.9
05	275 28.0	275 14.4	22.9	11 35.8	19.2	207 22.8	27.7	218 17.3	12.0
06	290 30.4	290 17.4	N 6 22.1	26 37.4	S23 19.3	222 24.8	N21 27.8	233 19.5	N18 12.1
07	305 32.9	305 20.3	21.2	41 39.1	19.4	237 26.7	27.8	248 21.6	12.1
08	320 35.3	320 23.3	20.4	56 40.8	19.5	252 28.7	27.9	263 23.8	12.2
09	335 37.8	335 26.3	19.6	71 42.5	19.6	267 30.6	28.0	278 26.0	12.3
10	350 40.3	350 29.2	18.7	86 44.1	19.7	282 32.6	28.1	293 28.2	12.3
11	5 42.7	5 32.2	17.9	101 45.8	19.8	297 34.5	28.2	308 30.3	12.4
12	20 45.2	20 35.2	N 6 17.1	116 47.5	S23 19.9	312 36.5	N21 28.2	323 32.5	N18 12.5
13	35 47.7	35 38.1	16.3	131 49.2	20.0	327 38.5	28.3	338 34.7	12.5
14	50 50.1	50 41.1	15.4	146 50.8	20.2	342 40.4	28.4	353 36.9	12.6
15	65 52.6	65 44.0	14.6	161 52.5	20.3	357 42.4	28.5	8 39.1	12.7
16	80 55.1	80 46.9	13.8	176 54.2	20.4	12 44.3	28.5	23 41.2	12.7
17	95 57.5	95 49.9	13.0	191 55.9	20.5	27 46.3	28.6	38 43.4	12.8
18	111 00.0	110 52.8	N 6 12.2	206 57.6	S23 20.6	42 48.2	N21 28.7	53 45.6	N18 12.9
19	126 02.5	125 55.7	11.3	221 59.2	20.7	57 50.2	28.8	68 47.8	12.9
20	141 04.9	140 58.7	10.5	237 00.9	20.8	72 52.1	28.9	83 49.9	13.0
21	156 07.4	156 01.6	09.7	252 02.6	20.9	87 54.1	28.9	98 52.1	13.1
22	171 09.8	171 04.5	08.9	267 04.3	21.0	102 56.0	29.0	113 54.3	13.1
23	186 12.3	186 07.4	08.1	282 06.0	21.1	117 58.0	29.1	128 56.5	13.2
Pas. Mer.	h m 10 41.1	*v* 3.0	*d* 0.9	*v* 1.7	*d* 0.1	*v* 2.0	*d* 0.1	*v* 2.2	*d* 0.1

ESTRELLAS		
Nombre	A.H.S.	Dec.
	° ′	° ′
Acamar	315 25.9	S40 18.3
Achernar	335 34.4	S57 14.0
Acrux	173 19.5	S63 06.4
Adhara	255 20.1	S28 58.7
Aldebaran	291 00.6	N16 30.6
Alioth	166 28.4	N55 57.3
Alkaid	153 05.9	N49 18.4
Al Na'ir	27 55.9	S46 57.3
Alnilam	275 56.2	S 1 12.2
Alphard	218 05.4	S 8 39.9
Alphecca	126 18.8	N26 42.5
Alpheratz	357 53.8	N29 05.6
Altair	62 17.6	N 8 52.1
Ankaa	353 25.5	S42 18.1
Antares	112 37.8	S26 26.0
Arcturus	146 04.1	N19 10.5
Atria	107 48.0	S69 01.6
Avior	234 21.8	S59 31.1
Bellatrix	278 42.5	N 6 20.9
Betelgeuse	271 11.8	N 7 24.3
Canopus	264 00.6	S52 42.1
Capella	280 48.9	N46 00.0
Deneb	49 38.2	N45 16.7
Denebola	182 43.1	N14 33.9
Diphda	349 05.8	S17 59.0
Dubhe	194 02.7	N61 44.9
Elnath	278 24.9	N28 36.5
Eltanin	90 50.4	N51 29.0
Enif	33 56.7	N 9 52.6
Fomalhaut	15 34.8	S29 37.0
Gacrux	172 11.2	S57 07.2
Gienah	176 01.9	S17 33.0
Hadar	149 01.0	S60 22.7
Hamal	328 11.9	N23 27.9
Kaus Aust	83 56.4	S34 23.0
Kochab	137 18.4	N74 09.0
Markab	13 48.2	N15 12.4
Menkar	314 25.4	N 4 05.5
Menkent	148 18.5	S36 22.5
Miaplacidus	221 41.4	S69 43.6
Mirfak	308 54.6	N49 51.9
Nunki	76 10.1	S26 17.7
Peacock	53 34.4	S56 43.7
Pollux	243 39.4	N28 01.5
Procyon	245 09.7	N 5 13.2
Rasalhague	96 15.2	N12 33.4
Regulus	207 53.5	N11 57.7
Rigel	281 21.4	S 8 12.2
Rigil Kent.	140 04.4	S60 50.3
Sabik	102 23.3	S15 43.6
Schedar	349 52.1	N56 32.4
Shaula	96 34.7	S37 06.2
Sirius	258 42.3	S16 43.3
Spica	158 41.0	S11 10.1
Suhail	222 59.4	S43 26.5
Vega	80 45.4	N38 46.8
Zuben'ubi	137 15.7	S16 02.8

	A.H.S.	Pas. Mer.
	° ′	h m
Venus	359 29.8	10 43
Marte	96 31.2	4 16
Júpiter	292 09.5	15 12
Saturno	302 57.6	14 29

T.U.	SOL				LUNA					
	A.H.G.		Dec.		A.H.G.	v	Dec.	d	P.H.	
d h	° ′		° ′		° ′	′	° ′	′	′	
10 00	179 39.1	N	7 53.3		335 03.2	10.6	S12 13.5	11.5	58.0	
01	194 39.3		54.3		349 32.8	10.5	12 25.0	11.5	58.0	
02	209 39.4		55.2		4 02.3	10.6	12 36.5	11.3	58.0	
03	224 39.6	. .	56.1		18 31.9	10.6	12 47.8	11.3	57.9	
04	239 39.8		57.0		33 01.5	10.5	12 59.1	11.1	57.9	
05	254 40.0		58.0		47 31.0	10.5	13 10.2	11.1	57.9	
06	269 40.1	N	7 58.9		62 00.5	10.5	S13 21.3	11.0	57.8	
07	284 40.3		7 59.8		76 30.0	10.6	13 32.3	11.0	57.8	
M 08	299 40.5		8 00.7		90 59.6	10.4	13 43.3	10.8	57.8	
A 09	314 40.6	. .	01.6		105 29.0	10.5	13 54.1	10.8	57.7	
R 10	329 40.8		02.6		119 58.5	10.5	14 04.9	10.6	57.7	
11	344 41.0		03.5		134 28.0	10.5	14 15.5	10.6	57.7	
T 12	359 41.1	N	8 04.4		148 57.5	10.4	S14 26.1	10.5	57.6	
13	14 41.3		05.3		163 26.9	10.5	14 36.6	10.4	57.6	
E 14	29 41.5		06.3		177 56.4	10.4	14 47.0	10.3	57.6	
15	44 41.6	. .	07.2		192 25.8	10.4	14 57.3	10.2	57.5	
S 16	59 41.8		08.1		206 55.2	10.4	15 07.5	10.1	57.5	
17	74 42.0		09.0		221 24.6	10.4	15 17.6	10.0	57.5	
18	89 42.1	N	8 09.9		235 54.0	10.4	S15 27.6	10.0	57.4	
19	104 42.3		10.9		250 23.4	10.4	15 37.6	9.8	57.4	
20	119 42.5		11.8		264 52.8	10.3	15 47.4	9.8	57.4	
21	134 42.6	. .	12.7		279 22.1	10.4	15 57.2	9.6	57.3	
22	149 42.8		13.6		293 51.5	10.3	16 06.8	9.6	57.3	
23	164 43.0		14.5		308 20.8	10.3	16 16.4	9.4	57.3	
11 00	179 43.1	N	8 15.5		322 50.1	10.3	S16 25.8	9.4	57.2	
01	194 43.3		16.4		337 19.4	10.3	16 35.2	9.2	57.2	
02	209 43.5		17.3		351 48.7	10.3	16 44.4	9.2	57.2	
03	224 43.6	. .	18.2		6 18.0	10.3	16 53.6	9.1	57.1	
04	239 43.8		19.1		20 47.3	10.3	17 02.7	8.9	57.1	
05	254 44.0		20.1		35 16.6	10.2	17 11.6	8.9	57.1	
06	269 44.1	N	8 21.0		49 45.8	10.3	S17 20.5	8.7	57.0	
M 07	284 44.3		21.9		64 15.1	10.2	17 29.2	8.7	57.0	
I 08	299 44.5		22.8		78 44.3	10.2	17 37.9	8.5	57.0	
E 09	314 44.6	. .	23.7		93 13.5	10.2	17 46.4	8.5	56.9	
R 10	329 44.8		24.6		107 42.7	10.2	17 54.9	8.3	56.9	
C 11	344 45.0		25.6		122 11.9	10.2	18 03.2	8.3	56.9	
O 12	359 45.1	N	8 26.5		136 41.1	10.2	S18 11.5	8.1	56.8	
L 13	14 45.3		27.4		151 10.3	10.1	18 19.6	8.0	56.8	
E 14	29 45.5		28.3		165 39.4	10.2	18 27.6	7.9	56.8	
S 15	44 45.6	. .	29.2		180 08.6	10.1	18 35.5	7.8	56.7	
16	59 45.8		30.1		194 37.7	10.2	18 43.3	7.7	56.7	
17	74 45.9		31.1		209 06.9	10.1	18 51.0	7.6	56.7	
18	89 46.1	N	8 32.0		223 36.0	10.1	S18 58.6	7.5	56.6	
19	104 46.3		32.9		238 05.1	10.1	19 06.1	7.4	56.6	
20	119 46.4		33.8		252 34.2	10.1	19 13.5	7.3	56.6	
21	134 46.6	. .	34.7		267 03.3	10.1	19 20.8	7.1	56.5	
22	149 46.8		35.6		281 32.4	10.1	19 27.9	7.1	56.5	
23	164 46.9		36.5		296 01.5	10.1	19 35.0	6.9	56.5	
12 00	179 47.1	N	8 37.5		310 30.6	10.0	S19 41.9	6.9	56.5	
01	194 47.3		38.4		324 59.6	10.1	19 48.8	6.7	56.4	
02	209 47.4		39.3		339 28.7	10.1	19 55.5	6.6	56.4	
03	224 47.6	. .	40.2		353 57.8	10.0	20 02.1	6.5	56.4	
04	239 47.7		41.1		8 26.8	10.0	20 08.6	6.3	56.3	
05	254 47.9		42.0		22 55.8	10.1	20 14.9	6.3	56.3	
06	269 48.1	N	8 42.9		37 24.9	10.0	S20 21.2	6.2	56.3	
07	284 48.2		43.8		51 53.9	10.0	20 27.4	6.0	56.2	
J 08	299 48.4		44.7		66 22.9	10.1	20 33.4	5.9	56.2	
U 09	314 48.6	. .	45.7		80 52.0	10.0	20 39.3	5.8	56.2	
E 10	329 48.7		46.6		95 21.0	10.0	20 45.1	5.7	56.1	
11	344 48.9		47.5		109 50.0	10.0	20 50.8	5.6	56.1	
V 12	359 49.0	N	8 48.4		124 19.0	10.0	S20 56.4	5.5	56.1	
13	14 49.2		49.3		138 48.0	10.0	21 01.9	5.3	56.0	
E 14	29 49.4		50.2		153 17.0	10.1	21 07.2	5.3	56.0	
15	44 49.5	. .	51.1		167 46.1	10.0	21 12.5	5.1	56.0	
S 16	59 49.7		52.0		182 15.1	10.0	21 17.6	5.0	56.0	
17	74 49.9		52.9		196 44.1	10.0	21 22.6	4.9	55.9	
18	89 50.0	N	8 53.9		211 13.1	10.0	S21 27.5	4.8	55.9	
19	104 50.2		54.8		225 42.1	10.0	21 32.3	4.6	55.9	
20	119 50.3		55.7		240 11.1	10.0	21 36.9	4.6	55.8	
21	134 50.5	. .	56.6		254 40.1	10.0	21 41.5	4.4	55.8	
22	149 50.7		57.5		269 09.1	10.0	21 45.9	4.3	55.8	
23	164 50.8		58.4		283 38.1	10.1	S21 50.2	4.2	55.8	
	SD 16.0		d 0.9		SD 15.7		15.5		15.3	

Lat.	Crepúsculo Náutico	Crepúsculo Civil	Orto Sol	Orto Luna 10	Orto Luna 11	Orto Luna 12	Orto Luna 13
°	h m	h m	h m	h m	h m	h m	h m
N 72	////	02 32	04 02	25 01	01 01	▬	▬
N 70	////	03 00	04 15	24 09	00 09	▬	▬
68	01 33	03 21	04 26	23 36	25 39	01 39	▬
66	02 11	03 37	04 35	23 13	24 58	00 58	02 38
64	02 37	03 50	04 43	22 55	24 30	00 30	01 58
62	02 56	04 01	04 50	22 40	24 09	00 09	01 30
60	03 12	04 10	04 55	22 27	23 52	25 09	01 09
N 58	03 25	04 18	05 00	22 17	23 38	24 51	00 51
56	03 36	04 25	05 05	22 07	23 26	24 37	00 37
54	03 45	04 31	05 09	21 59	23 15	24 24	00 24
52	03 53	04 37	05 12	21 52	23 05	24 13	00 13
50	04 01	04 42	05 15	21 45	22 57	24 03	00 03
45	04 16	04 52	05 23	21 31	22 39	23 42	24 39
N 40	04 27	05 01	05 28	21 20	22 25	23 26	24 22
35	04 37	05 08	05 33	21 10	22 12	23 12	24 07
30	04 45	05 13	05 38	21 01	22 02	23 00	23 54
20	04 57	05 23	05 45	20 46	21 43	22 39	23 32
N 10	05 06	05 30	05 52	20 34	21 27	22 21	23 13
0	05 13	05 37	05 58	20 22	21 13	22 04	22 55
S 10	05 18	05 42	06 04	20 10	20 58	21 47	22 37
20	05 22	05 48	06 10	19 57	20 42	21 29	22 18
30	05 25	05 53	06 17	19 43	20 25	21 09	21 57
35	05 26	05 55	06 21	19 35	20 14	20 57	21 44
40	05 26	05 58	06 25	19 25	20 02	20 44	21 29
45	05 26	06 00	06 30	19 15	19 49	20 27	21 12
S 50	05 26	06 03	06 36	19 01	19 32	20 08	20 50
52	05 26	06 05	06 39	18 55	19 24	19 58	20 40
54	05 25	06 06	06 42	18 49	19 15	19 48	20 28
56	05 25	06 08	06 45	18 41	19 05	19 36	20 15
58	05 24	06 09	06 49	18 33	18 54	19 22	20 00
S 60	05 23	06 11	06 53	18 23	18 41	19 06	19 41

Lat.	Ocaso Sol	Crepúsculo Civil	Crepúsculo Náutico	Ocaso Luna 10	Ocaso Luna 11	Ocaso Luna 12	Ocaso Luna 13
°	h m	h m	h m	h m	h m	h m	h m
N 72	20 04	21 36	////	04 43	03 50	▬	▬
N 70	19 50	21 06	////	05 08	04 43	▬	▬
68	19 38	20 45	22 38	05 26	05 17	05 01	▬
66	19 29	20 28	21 57	05 41	05 41	05 42	05 49
64	19 21	20 14	21 29	05 54	06 00	06 11	06 30
62	19 14	20 03	21 09	06 05	06 16	06 32	06 58
60	19 08	19 54	20 53	06 14	06 29	06 50	07 20
N 58	19 03	19 45	20 39	06 22	06 40	07 05	07 37
56	18 59	19 38	20 28	06 29	06 50	07 17	07 52
54	18 55	19 32	20 19	06 35	06 59	07 28	08 05
52	18 51	19 26	20 10	06 41	07 07	07 38	08 16
50	18 48	19 21	20 03	06 46	07 14	07 47	08 26
45	18 40	19 11	19 47	06 57	07 29	08 06	08 47
N 40	18 34	19 02	19 35	07 07	07 42	08 21	09 04
35	18 29	18 55	19 26	07 15	07 53	08 34	09 19
30	18 25	18 49	19 18	07 22	08 02	08 45	09 31
20	18 17	18 39	19 06	07 34	08 18	09 05	09 53
N 10	18 10	18 32	18 56	07 45	08 33	09 22	10 11
0	18 04	18 25	18 49	07 55	08 46	09 37	10 29
S 10	17 58	18 19	18 44	08 06	09 00	09 53	10 46
20	17 52	18 14	18 40	08 16	09 14	10 10	11 05
30	17 45	18 09	18 37	08 29	09 30	10 30	11 26
35	17 41	18 06	18 36	08 36	09 40	10 41	11 39
40	17 36	18 04	18 35	08 45	09 51	10 54	11 53
45	17 31	18 01	18 35	08 54	10 04	11 10	12 10
S 50	17 25	17 58	18 35	09 06	10 20	11 29	12 32
52	17 22	17 56	18 35	09 12	10 27	11 38	12 42
54	17 19	17 55	18 36	09 18	10 36	11 48	12 53
56	17 16	17 53	18 36	09 24	10 45	12 00	13 06
58	17 12	17 52	18 37	09 32	10 56	12 13	13 22
S 60	17 08	17 50	18 38	09 41	11 08	12 29	13 40

Día	SOL E.T. (−) 00h	SOL E.T. (−) 12h	SOL Pas. Mer.	LUNA Pas. Sup.	LUNA Mer. Inf.	LUNA Edad	LUNA Fase
d	m s	m s	h m	h m	h m	d %	
10	01 24	01 16	12 01	01 43	14 09	16 93	
11	01 08	01 00	12 01	02 34	14 59	17 87	◑
12	00 52	00 44	12 01	03 25	15 51	18 79	

T.U.	ARIES	VENUS −4.4		MARTE −0.6		JUPITER −2.0		SATURNO +0.2	
	A.H.G.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
13 00	201 14.8	201 10.3	N 6 07.3	297 07.7	S23 21.2	132 59.9	N21 29.2	143 58.6	N18 13.3
01	216 17.2	216 13.2	06.5	312 09.4	21.4	148 01.9	29.2	159 00.8	13.3
02	231 19.7	231 16.1	05.7	327 11.0	21.5	163 03.8	29.3	174 03.0	13.4
03	246 22.2	246 19.0	. . 04.9	342 12.7	. . 21.6	178 05.8	. . 29.4	189 05.2	. . 13.5
04	261 24.6	261 21.9	04.1	357 14.4	21.7	193 07.7	29.5	204 07.3	13.5
05	276 27.1	276 24.8	03.2	12 16.1	21.8	208 09.7	29.5	219 09.5	13.6
06	291 29.6	291 27.7	N 6 02.4	27 17.8	S23 21.9	223 11.7	N21 29.6	234 11.7	N18 13.7
07	306 32.0	306 30.6	01.6	42 19.5	22.0	238 13.6	29.7	249 13.9	13.7
08	321 34.5	321 33.5	00.8	57 21.2	22.1	253 15.6	29.8	264 16.0	13.8
V 09	336 37.0	336 36.3	6 00.0	72 22.9	. . 22.2	268 17.5	. . 29.9	279 18.2	. . 13.9
I 10	351 39.4	351 39.2	5 59.3	87 24.6	22.3	283 19.5	29.9	294 20.4	13.9
E 11	6 41.9	6 42.1	58.5	102 26.3	22.4	298 21.4	30.0	309 22.5	14.0
R 12	21 44.3	21 44.9	N 5 57.7	117 28.0	S23 22.6	313 23.4	N21 30.1	324 24.7	N18 14.1
N 13	36 46.8	36 47.8	56.9	132 29.7	22.7	328 25.3	30.2	339 26.9	14.2
E 14	51 49.3	51 50.6	56.1	147 31.4	22.8	343 27.3	30.2	354 29.1	14.2
S 15	66 51.7	66 53.5	. . 55.3	162 33.1	. . 22.9	358 29.2	. . 30.3	9 31.2	. . 14.3
16	81 54.2	81 56.3	54.5	177 34.8	23.0	13 31.2	30.4	24 33.4	14.4
17	96 56.7	96 59.2	53.7	192 36.5	23.1	28 33.1	30.5	39 35.6	14.4
18	111 59.1	112 02.0	N 5 52.9	207 38.2	S23 23.2	43 35.1	N21 30.6	54 37.8	N18 14.5
19	127 01.6	127 04.9	52.2	222 39.9	23.3	58 37.0	30.6	69 39.9	14.6
20	142 04.1	142 07.7	51.4	237 41.6	23.4	73 39.0	30.7	84 42.1	14.6
21	157 06.5	157 10.5	. . 50.6	252 43.3	. . 23.5	88 40.9	. . 30.8	99 44.3	. . 14.7
22	172 09.0	172 13.3	49.8	267 45.0	23.6	103 42.9	30.9	114 46.5	14.8
23	187 11.4	187 16.2	49.0	282 46.7	23.7	118 44.8	30.9	129 48.6	14.8
14 00	202 13.9	202 19.0	N 5 48.3	297 48.4	S23 23.9	133 46.8	N21 31.0	144 50.8	N18 14.9
01	217 16.4	217 21.8	47.5	312 50.1	24.0	148 48.7	31.1	159 53.0	15.0
02	232 18.8	232 24.6	46.7	327 51.8	24.1	163 50.7	31.2	174 55.1	15.0
03	247 21.3	247 27.4	. . 45.9	342 53.5	. . 24.2	178 52.6	. . 31.2	189 57.3	. . 15.1
04	262 23.8	262 30.2	45.2	357 55.2	24.3	193 54.5	31.3	204 59.5	15.2
05	277 26.2	277 33.0	44.4	12 56.9	24.4	208 56.5	31.4	220 01.7	15.2
06	292 28.7	292 35.8	N 5 43.6	27 58.6	S23 24.5	223 58.4	N21 31.5	235 03.8	N18 15.3
S 07	307 31.2	307 38.6	42.9	43 00.4	24.6	239 00.4	31.6	250 06.0	15.4
08	322 33.6	322 41.3	42.1	58 02.1	24.7	254 02.3	31.6	265 08.2	15.4
A 09	337 36.1	337 44.1	. . 41.3	73 03.8	. . 24.8	269 04.3	. . 31.7	280 10.3	. . 15.5
10	352 38.6	352 46.9	40.6	88 05.5	24.9	284 06.2	31.8	295 12.5	15.6
B 11	7 41.0	7 49.7	39.8	103 07.2	25.0	299 08.2	31.9	310 14.7	15.6
A 12	22 43.5	22 52.4	N 5 39.1	118 08.9	S23 25.2	314 10.1	N21 31.9	325 16.9	N18 15.7
13	37 45.9	37 55.2	38.3	133 10.7	25.3	329 12.1	32.0	340 19.0	15.8
D 14	52 48.4	52 58.0	37.6	148 12.4	25.4	344 14.0	32.1	355 21.2	15.8
15	67 50.9	68 00.7	. . 36.8	163 14.1	. . 25.5	359 16.0	. . 32.2	10 23.4	. . 15.9
O 16	82 53.3	83 03.5	36.1	178 15.8	25.6	14 17.9	32.2	25 25.6	16.0
17	97 55.8	98 06.2	35.3	193 17.5	25.7	29 19.9	32.3	40 27.7	16.0
18	112 58.3	113 09.0	N 5 34.6	208 19.3	S23 25.8	44 21.8	N21 32.4	55 29.9	N18 16.1
19	128 00.7	128 11.7	33.8	223 21.0	25.9	59 23.8	32.5	70 32.1	16.2
20	143 03.2	143 14.4	33.1	238 22.7	26.0	74 25.7	32.6	85 34.2	16.2
21	158 05.7	158 17.2	. . 32.3	253 24.4	. . 26.1	89 27.6	. . 32.6	100 36.4	. . 16.3
22	173 08.1	173 19.9	31.6	268 26.1	26.2	104 29.6	32.7	115 38.6	16.4
23	188 10.6	188 22.6	30.8	283 27.9	26.3	119 31.5	32.8	130 40.7	16.5
15 00	203 13.1	203 25.3	N 5 30.1	298 29.6	S23 26.5	134 33.5	N21 32.9	145 42.9	N18 16.5
01	218 15.5	218 28.1	29.4	313 31.3	26.6	149 35.4	32.9	160 45.1	16.6
02	233 18.0	233 30.8	28.6	328 33.1	26.7	164 37.4	33.0	175 47.3	16.7
03	248 20.4	248 33.5	. . 27.9	343 34.8	. . 26.8	179 39.3	. . 33.1	190 49.4	. . 16.7
04	263 22.9	263 36.2	27.2	358 36.5	26.9	194 41.3	33.2	205 51.6	16.8
05	278 25.4	278 38.9	26.4	13 38.2	27.0	209 43.2	33.2	220 53.8	16.9
06	293 27.8	293 41.6	N 5 25.7	28 40.0	S23 27.1	224 45.1	N21 33.3	235 55.9	N18 16.9
07	308 30.3	308 44.3	25.0	43 41.7	27.2	239 47.1	33.4	250 58.1	17.0
D 08	323 32.8	323 47.0	24.3	58 43.4	27.3	254 49.0	33.5	266 00.3	17.1
O 09	338 35.2	338 49.6	. . 23.5	73 45.2	. . 27.4	269 51.0	. . 33.6	281 02.4	. . 17.1
M 10	353 37.7	353 52.3	22.8	88 46.9	27.5	284 52.9	33.6	296 04.6	17.2
I 11	8 40.2	8 55.0	22.1	103 48.7	27.6	299 54.9	33.7	311 06.8	17.3
N 12	23 42.6	23 57.7	N 5 21.4	118 50.4	S23 27.8	314 56.8	N21 33.8	326 09.0	N18 17.3
G 13	38 45.1	39 00.3	20.7	133 52.1	27.9	329 58.7	33.9	341 11.1	17.4
O 14	53 47.6	54 03.0	19.9	148 53.9	28.0	345 00.7	33.9	356 13.3	17.5
15	68 50.0	69 05.7	. . 19.2	163 55.6	. . 28.1	0 02.6	. . 34.0	11 15.5	. . 17.5
16	83 52.5	84 08.3	18.5	178 57.3	28.2	15 04.6	34.1	26 17.6	17.6
17	98 54.9	99 11.0	17.8	193 59.1	28.3	30 06.5	34.2	41 19.8	17.7
18	113 57.4	114 13.6	N 5 17.1	209 00.8	S23 28.4	45 08.5	N21 34.2	56 22.0	N18 17.7
19	128 59.9	129 16.3	16.4	224 02.6	28.5	60 10.4	34.3	71 24.1	17.8
20	144 02.3	144 18.9	15.7	239 04.3	28.6	75 12.3	34.4	86 26.3	17.9
21	159 04.8	159 21.5	. . 15.0	254 06.1	. . 28.7	90 14.3	. . 34.5	101 28.5	. . 17.9
22	174 07.3	174 24.2	14.3	269 07.8	28.8	105 16.2	34.6	116 30.7	18.0
23	189 09.7	189 26.8	13.6	284 09.6	28.9	120 18.2	34.6	131 32.8	18.1
	h m								
Pas. Mer.	10 29.3	v 2.8	d 0.8	v 1.7	d 0.1	v 1.9	d 0.1	v 2.2	d 0.1

ESTRELLAS		
Nombre	A.H.S.	Dec.
	° ′	° ′
Acamar	315 26.0	S40 18.2
Achernar	335 34.4	S57 14.0
Acrux	173 19.5	S63 06.4
Adhara	255 20.1	S28 58.7
Aldebaran	291 00.6	N16 30.6
Alioth	166 28.4	N55 57.3
Alkaid	153 05.9	N49 18.4
Al Na'ir	27 55.9	S46 57.3
Alnilam	275 56.3	S 1 12.2
Alphard	218 05.4	S 8 39.9
Alphecca	126 18.8	N26 42.5
Alpheratz	357 53.8	N29 05.6
Altair	62 17.6	N 8 52.1
Ankaa	353 25.5	S42 18.1
Antares	112 37.8	S26 26.0
Arcturus	146 04.1	N19 10.5
Atria	107 47.9	S69 01.6
Avior	234 21.9	S59 31.1
Bellatrix	278 42.5	N 6 20.9
Betelgeuse	271 11.8	N 7 24.3
Canopus	264 00.6	S52 42.1
Capella	280 48.9	N46 00.0
Deneb	49 38.1	N45 16.7
Denebola	182 43.1	N14 33.9
Diphda	349 05.8	S17 59.0
Dubhe	194 02.8	N61 44.9
Elnath	278 24.9	N28 36.5
Eltanin	90 50.4	N51 29.1
Enif	33 56.7	N 9 52.6
Fomalhaut	15 34.7	S29 37.0
Gacrux	172 11.1	S57 07.3
Gienah	176 01.9	S17 33.0
Hadar	149 01.0	S60 22.7
Hamal	328 11.9	N23 27.9
Kaus Aust.	83 56.4	S34 23.0
Kochab	137 18.4	N74 09.0
Markab	13 48.1	N15 12.4
Menkar	314 25.4	N 4 05.5
Menkent	148 18.5	S36 22.5
Miaplacidus	221 41.5	S69 43.6
Mirfak	308 54.6	N49 51.9
Nunki	76 10.1	S26 17.7
Peacock	53 34.3	S56 43.7
Pollux	243 39.4	N28 01.5
Procyon	245 09.8	N 5 13.2
Rasalhague	96 15.2	N12 33.4
Regulus	207 53.5	N11 57.7
Rigel	281 21.5	S 8 12.2
Rigil Kent.	140 04.4	S60 50.3
Sabik	102 23.3	S15 43.6
Schedar	349 52.1	N56 32.4
Shaula	96 34.7	S37 06.2
Sirius	258 42.3	S16 43.3
Spica	158 41.0	S11 10.1
Suhail	222 59.4	S43 26.5
Vega	80 45.3	N38 46.8
Zuben'ubi	137 15.7	S16 02.8

	A.H.S.	Pas. Mer.
	° ′	h m
Venus	0 05.1	10 29
Marte	95 34.5	4 08
Júpiter	291 32.8	15 03
Saturno	302 36.9	14 19

T.U.	SOL				LUNA					
	A.H.G.		Dec.		A.H.G.	v	Dec.	d	P.H.	
d h	° ′		° ′		° ′	′	° ′	′	′	
13 00	179 51.0	N	8 59.3		298 07.2	10.0	S21 54.4	4.1	55.7	
01	194 51.1		9 00.2		312 36.2	10.0	21 58.5	3.9	55.7	
02	209 51.3		01.1		327 05.2	10.0	22 02.4	3.9	55.7	
03	224 51.5	. .	02.0		341 34.2	10.1	22 06.3	3.7	55.6	
04	239 51.6		02.9		356 03.3	10.0	22 10.0	3.6	55.6	
05	254 51.8		03.8		10 32.3	10.1	22 13.6	3.5	55.6	
06	269 51.9	N	9 04.7		25 01.4	10.0	S22 17.1	3.4	55.6	
07	284 52.1		05.6		39 30.4	10.1	22 20.5	3.2	55.5	
V 08	299 52.2		06.5		53 59.5	10.1	22 23.7	3.2	55.5	
I 09	314 52.4	. .	07.5		68 28.6	10.1	22 26.9	3.0	55.5	
E 10	329 52.6		08.4		82 57.7	10.1	22 29.9	2.9	55.5	
R 11	344 52.7		09.3		97 26.8	10.1	22 32.8	2.8	55.4	
N 12	359 52.9	N	9 10.2		111 55.9	10.1	S22 35.6	2.7	55.4	
E 13	14 53.0		11.1		126 25.0	10.1	22 38.3	2.5	55.4	
S 14	29 53.2		12.0		140 54.1	10.2	22 40.8	2.5	55.3	
15	44 53.4	. .	12.9		155 23.3	10.1	22 43.3	2.3	55.3	
16	59 53.5		13.8		169 52.4	10.2	22 45.6	2.2	55.3	
17	74 53.7		14.7		184 21.6	10.2	22 47.8	2.1	55.3	
18	89 53.8	N	9 15.6		198 50.8	10.2	S22 49.9	1.9	55.3	
19	104 54.0		16.5		213 20.0	10.2	22 51.8	1.9	55.2	
20	119 54.1		17.4		227 49.2	10.2	22 53.7	1.7	55.2	
21	134 54.3	. .	18.3		242 18.4	10.2	22 55.4	1.6	55.2	
22	149 54.5		19.2		256 47.6	10.3	22 57.0	1.5	55.2	
23	164 54.6		20.1		271 16.9	10.3	22 58.5	1.4	55.1	
14 00	179 54.8	N	9 21.0		285 46.2	10.3	S22 59.9	1.3	55.1	
01	194 54.9		21.9		300 15.5	10.3	23 01.2	1.1	55.1	
02	209 55.1		22.8		314 44.8	10.3	23 02.3	1.1	55.1	
03	224 55.2	. .	23.7		329 14.1	10.4	23 03.4	0.9	55.0	
04	239 55.4		24.6		343 43.5	10.3	23 04.3	0.8	55.0	
05	254 55.5		25.5		358 12.8	10.4	23 05.1	0.7	55.0	
06	269 55.7	N	9 26.4		12 42.2	10.4	S23 05.8	0.5	55.0	
07	284 55.9		27.3		27 11.6	10.5	23 06.3	0.5	55.0	
S 08	299 56.0		28.2		41 41.1	10.4	23 06.8	0.3	54.9	
A 09	314 56.2	. .	29.1		56 10.5	10.5	23 07.1	0.3	54.9	
B 10	329 56.3		30.0		70 40.0	10.5	23 07.4	0.1	54.9	
A 11	344 56.5		30.9		85 09.5	10.6	23 07.5	0.0	54.9	
D 12	359 56.6	N	9 31.8		99 39.1	10.5	S23 07.5	0.1	54.9	
O 13	14 56.8		32.7		114 08.6	10.6	23 07.4	0.2	54.8	
14	29 56.9		33.6		128 38.2	10.6	23 07.2	0.4	54.8	
15	44 57.1	. .	34.5		143 07.8	10.6	23 06.8	0.4	54.8	
16	59 57.2		35.4		157 37.4	10.7	23 06.4	0.6	54.8	
17	74 57.4		36.3		172 07.1	10.7	23 05.8	0.7	54.8	
18	89 57.6	N	9 37.2		186 36.8	10.7	S23 05.1	0.8	54.7	
19	104 57.7		38.1		201 06.5	10.8	23 04.3	0.9	54.7	
20	119 57.9		39.0		215 36.3	10.7	23 03.4	1.0	54.7	
21	134 58.0	. .	39.9		230 06.0	10.8	23 02.4	1.1	54.7	
22	149 58.2		40.8		244 35.8	10.9	23 01.3	1.2	54.7	
23	164 58.3		41.7		259 05.7	10.9	23 00.1	1.4	54.7	
15 00	179 58.5	N	9 42.5		273 35.6	10.9	S22 58.7	1.4	54.6	
01	194 58.6		43.4		288 05.5	10.9	22 57.3	1.6	54.6	
02	209 58.8		44.3		302 35.4	10.9	22 55.7	1.7	54.6	
03	224 58.9	. .	45.2		317 05.3	11.0	22 54.0	1.7	54.6	
04	239 59.1		46.1		331 35.3	11.1	22 52.3	1.9	54.6	
05	254 59.2		47.0		346 05.4	11.0	22 50.4	2.0	54.6	
06	269 59.4	N	9 47.9		0 35.4	11.1	S22 48.4	2.1	54.6	
07	284 59.5		48.8		15 05.5	11.2	22 46.3	2.3	54.5	
D 08	299 59.7		49.7		29 35.7	11.1	22 44.0	2.3	54.5	
O 09	314 59.8	. .	50.6		44 05.8	11.2	22 41.7	2.4	54.5	
M 10	330 00.0		51.5		58 36.0	11.2	22 39.3	2.5	54.5	
I 11	345 00.1		52.4		73 06.2	11.3	22 36.8	2.7	54.5	
N 12	0 00.3	N	9 53.3		87 36.5	11.3	S22 34.1	2.7	54.5	
G 13	15 00.4		54.2		102 06.8	11.4	22 31.4	2.9	54.5	
O 14	30 00.6		55.0		116 37.2	11.3	22 28.5	2.9	54.4	
15	45 00.7	. .	55.9		131 07.5	11.5	22 25.6	3.1	54.4	
16	60 00.9		56.8		145 38.0	11.4	22 22.5	3.2	54.4	
17	75 01.0		57.7		160 08.4	11.5	22 19.3	3.2	54.4	
18	90 01.2	N	9 58.6		174 38.9	11.5	S22 16.1	3.4	54.4	
19	105 01.3		9 59.5		189 09.4	11.6	22 12.7	3.5	54.4	
20	120 01.5		10 00.4		203 40.0	11.6	22 09.2	3.5	54.4	
21	135 01.6	. .	01.3		218 10.6	11.6	22 05.7	3.7	54.4	
22	150 01.8		02.2		232 41.2	11.7	22 02.0	3.8	54.4	
23	165 01.9		03.0		247 11.9	11.7	S21 58.2	3.9	54.4	
	SD 16.0		d 0.9		SD 15.1		14.9		14.8	

Lat.	Crepúsculo Náutico	Crepúsculo Civil	Orto Sol	Orto Luna 13	Orto Luna 14	Orto Luna 15	Orto Luna 16
°	h m	h m	h m	h m	h m	h m	h m
N 72		02 07	03 45	▬	▬	▬	▬
N 70		02 41	04 01	▬	▬	▬	▬
68	00 56	03 05	04 13	▬	▬	▬	05 58
66	01 49	03 23	04 24	02 38	04 01	04 43	04 55
64	02 20	03 38	04 33	01 58	03 09	03 55	04 20
62	02 42	03 50	04 40	01 30	02 36	03 24	03 55
60	03 00	04 01	04 46	01 09	02 13	03 01	03 35
N 58	03 14	04 09	04 52	00 51	01 53	02 42	03 19
56	03 26	04 17	04 57	00 37	01 38	02 27	03 05
54	03 37	04 24	05 02	00 24	01 24	02 13	02 52
52	03 46	04 30	05 06	00 13	01 12	02 02	02 42
50	03 54	04 35	05 09	00 03	01 02	01 51	02 32
45	04 10	04 47	05 17	24 39	00 39	01 29	02 12
N 40	04 22	04 56	05 24	24 22	00 22	01 12	01 56
35	04 33	05 03	05 29	24 07	00 07	00 57	01 42
30	04 41	05 10	05 34	23 54	24 44	00 44	01 30
20	04 54	05 20	05 43	23 32	24 22	00 22	01 09
N 10	05 04	05 29	05 50	23 13	24 03	00 03	00 51
0	05 12	05 36	05 57	22 55	23 46	24 35	00 35
S 10	05 18	05 42	06 04	22 37	23 28	24 18	00 18
20	05 23	05 48	06 11	22 18	23 09	24 00	00 00
30	05 26	05 54	06 18	21 57	22 47	23 39	24 33
35	05 28	05 57	06 23	21 44	22 34	23 27	24 22
40	05 29	06 01	06 28	21 29	22 19	23 13	24 09
45	05 30	06 04	06 34	21 12	22 02	22 57	23 55
S 50	05 30	06 08	06 41	20 50	21 40	22 36	23 37
52	05 30	06 10	06 44	20 40	21 30	22 26	23 28
54	05 30	06 11	06 47	20 28	21 18	22 15	23 19
56	05 30	06 13	06 51	20 15	21 04	22 03	23 08
58	05 30	06 15	06 56	20 00	20 49	21 48	22 56
S 60	05 30	06 18	07 00	19 41	20 30	21 31	22 41

Lat.	Ocaso Sol	Crepúsculo Civil	Crepúsculo Náutico	Ocaso Luna 13	Ocaso Luna 14	Ocaso Luna 15	Ocaso Luna 16
°	h m	h m	h m	h m	h m	h m	h m
N 72	20 20	22 01		▬	▬	▬	▬
N 70	20 03	21 25		▬	▬	▬	▬
68	19 50	20 59	23 22	▬	▬	▬	07 42
66	19 39	20 40	22 18	05 49	06 12	07 15	08 44
64	19 30	20 25	21 45	06 30	07 05	08 03	09 19
62	19 22	20 12	21 21	06 58	07 37	08 34	09 44
60	19 16	20 02	21 03	07 20	08 01	08 57	10 03
N 58	19 10	19 53	20 49	07 37	08 20	09 15	10 19
56	19 05	19 45	20 36	07 52	08 36	09 31	10 33
54	19 00	19 38	20 26	08 05	08 50	09 44	10 45
52	18 56	19 32	20 16	08 16	09 02	09 55	10 55
50	18 52	19 26	20 08	08 26	09 13	10 06	11 05
45	18 44	19 15	19 52	08 47	09 35	10 27	11 24
N 40	18 37	19 05	19 39	09 04	09 52	10 45	11 40
35	18 32	18 58	19 29	09 19	10 07	10 59	11 53
30	18 27	18 51	19 20	09 31	10 20	11 12	12 05
20	18 18	18 40	19 07	09 53	10 43	11 33	12 25
N 10	18 10	18 32	18 57	10 11	11 02	11 52	12 42
0	18 04	18 25	18 49	10 29	11 20	12 09	12 58
S 10	17 57	18 18	18 43	10 46	11 37	12 27	13 14
20	17 50	18 12	18 38	11 05	11 57	12 45	13 31
30	17 42	18 06	18 34	11 26	12 19	13 07	13 50
35	17 37	18 03	18 32	11 39	12 32	13 19	14 02
40	17 32	17 59	18 31	11 53	12 46	13 33	14 15
45	17 26	17 56	18 30	12 10	13 04	13 50	14 30
S 50	17 19	17 52	18 29	12 32	13 26	14 11	14 48
52	17 16	17 50	18 29	12 42	13 36	14 21	14 57
54	17 12	17 48	18 29	12 53	13 48	14 32	15 07
56	17 08	17 46	18 29	13 06	14 02	14 45	15 18
58	17 04	17 44	18 29	13 22	14 17	15 00	15 31
S 60	16 59	17 41	18 30	13 40	14 36	15 17	15 46

Día	SOL E.T. (−) (+) 00h	SOL E.T. (−) (+) 12h	SOL Pas. Mer.	LUNA Pas. Sup.	LUNA Mer. Inf.	LUNA Edad	LUNA Fase
d	m s	m s	h m	h m	h m	d	%
13	00 36	00 29	12 00	04 16	16 42	19	70
14	00 21	00 14	12 00	05 07	17 33	20	61
15	00 06	00 01	12 00	05 58	18 22	21	52

T.U.	ARIES	VENUS −4.4		MARTE −0.6		JUPITER −2.0		SATURNO +0.2	
	A.H.G.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
16 00	204 12.2	204 29.4	N 5 12.9	299 11.3	S23 29.0	135 20.1	N21 34.7	146 35.0	N18 18.1
01	219 14.7	219 32.0	12.2	314 13.1	29.2	150 22.1	34.8	161 37.2	18.2
02	234 17.1	234 34.7	11.5	329 14.8	29.3	165 24.0	34.9	176 39.3	18.3
03	249 19.6	249 37.3	. . 10.8	344 16.6	. . 29.4	180 25.9	. . 34.9	191 41.5	. . 18.4
04	264 22.0	264 39.9	10.1	359 18.3	29.5	195 27.9	35.0	206 43.7	18.4
05	279 24.5	279 42.5	09.4	14 20.1	29.6	210 29.8	35.1	221 45.8	18.5
06	294 27.0	294 45.1	N 5 08.7	29 21.8	S23 29.7	225 31.8	N21 35.2	236 48.0	N18 18.6
07	309 29.4	309 47.7	08.0	44 23.6	29.8	240 33.7	35.2	251 50.2	18.6
08	324 31.9	324 50.3	07.3	59 25.3	29.9	255 35.6	35.3	266 52.3	18.7
L 09	339 34.4	339 52.9	. . 06.6	74 27.1	. . 30.0	270 37.6	. . 35.4	281 54.5	. . 18.8
U 10	354 36.8	354 55.5	06.0	89 28.8	30.1	285 39.5	35.5	296 56.7	18.8
11	9 39.3	9 58.0	05.3	104 30.6	30.2	300 41.5	35.5	311 58.8	18.9
N 12	24 41.8	25 00.6	N 5 04.6	119 32.4	S23 30.3	315 43.4	N21 35.6	327 01.0	N18 19.0
E 13	39 44.2	40 03.2	03.9	134 34.1	30.4	330 45.3	35.7	342 03.2	19.0
14	54 46.7	55 05.8	03.2	149 35.9	30.6	345 47.3	35.8	357 05.3	19.1
S 15	69 49.2	70 08.3	. . 02.6	164 37.6	. . 30.7	0 49.2	. . 35.9	12 07.5	. . 19.2
16	84 51.6	85 10.9	01.9	179 39.4	30.8	15 51.2	35.9	27 09.7	19.2
17	99 54.1	100 13.4	01.2	194 41.2	30.9	30 53.1	36.0	42 11.8	19.3
18	114 56.5	115 16.0	N 5 00.6	209 42.9	S23 31.0	45 55.0	N21 36.1	57 14.0	N18 19.4
19	129 59.0	130 18.5	4 59.9	224 44.7	31.1	60 57.0	36.2	72 16.2	19.4
20	145 01.5	145 21.1	59.2	239 46.5	31.2	75 58.9	36.2	87 18.3	19.5
21	160 03.9	160 23.6	. . 58.6	254 48.2	. . 31.3	91 00.9	. . 36.3	102 20.5	. . 19.6
22	175 06.4	175 26.2	57.9	269 50.0	31.4	106 02.8	36.4	117 22.7	19.6
23	190 08.9	190 28.7	57.2	284 51.8	31.5	121 04.7	36.5	132 24.8	19.7
17 00	205 11.3	205 31.2	N 4 56.6	299 53.5	S23 31.6	136 06.7	N21 36.5	147 27.0	N18 19.8
01	220 13.8	220 33.8	55.9	314 55.3	31.7	151 08.6	36.6	162 29.2	19.8
02	235 16.3	235 36.3	55.3	329 57.1	31.8	166 10.5	36.7	177 31.3	19.9
03	250 18.7	250 38.8	. . 54.6	344 58.8	. . 32.0	181 12.5	. . 36.8	192 33.5	. . 20.0
04	265 21.2	265 41.3	54.0	0 00.6	32.1	196 14.4	36.8	207 35.7	20.0
05	280 23.7	280 43.8	53.3	15 02.4	32.2	211 16.4	36.9	222 37.8	20.1
06	295 26.1	295 46.3	N 4 52.7	30 04.2	S23 32.3	226 18.3	N21 37.0	237 40.0	N18 20.2
07	310 28.6	310 48.8	52.0	45 05.9	32.4	241 20.2	37.1	252 42.2	20.3
M 08	325 31.0	325 51.3	51.4	60 07.7	32.5	256 22.2	37.2	267 44.3	20.3
09	340 33.5	340 53.8	. . 50.7	75 09.5	. . 32.6	271 24.1	. . 37.2	282 46.5	. . 20.4
A 10	355 36.0	355 56.3	50.1	90 11.3	32.7	286 26.0	37.3	297 48.7	20.5
R 11	10 38.4	10 58.8	49.5	105 13.1	32.8	301 28.0	37.4	312 50.8	20.5
T 12	25 40.9	26 01.3	N 4 48.8	120 14.8	S23 32.9	316 29.9	N21 37.5	327 53.0	N18 20.6
13	40 43.4	41 03.8	48.2	135 16.6	33.0	331 31.8	37.5	342 55.2	20.7
E 14	55 45.8	56 06.3	47.5	150 18.4	33.1	346 33.8	37.6	357 57.3	20.7
S 15	70 48.3	71 08.7	. . 46.9	165 20.2	. . 33.2	1 35.7	. . 37.7	12 59.5	. . 20.8
16	85 50.8	86 11.2	46.3	180 22.0	33.4	16 37.7	37.8	28 01.7	20.9
17	100 53.2	101 13.7	45.7	195 23.8	33.5	31 39.6	37.8	43 03.8	20.9
18	115 55.7	116 16.1	N 4 45.0	210 25.5	S23 33.6	46 41.5	N21 37.9	58 06.0	N18 21.0
19	130 58.1	131 18.6	44.4	225 27.3	33.7	61 43.5	38.0	73 08.2	21.1
20	146 00.6	146 21.0	43.8	240 29.1	33.8	76 45.4	38.1	88 10.3	21.1
21	161 03.1	161 23.5	. . 43.2	255 30.9	. . 33.9	91 47.3	. . 38.1	103 12.5	. . 21.2
22	176 05.5	176 25.9	42.5	270 32.7	34.0	106 49.3	38.2	118 14.7	21.3
23	191 08.0	191 28.4	41.9	285 34.5	34.1	121 51.2	38.3	133 16.8	21.3
18 00	206 10.5	206 30.8	N 4 41.3	300 36.3	S23 34.2	136 53.1	N21 38.4	148 19.0	N18 21.4
01	221 12.9	221 33.2	40.7	315 38.1	34.3	151 55.1	38.4	163 21.2	21.5
02	236 15.4	236 35.7	40.1	330 39.9	34.4	166 57.0	38.5	178 23.3	21.5
03	251 17.9	251 38.1	. . 39.5	345 41.7	. . 34.5	181 58.9	. . 38.6	193 25.5	. . 21.6
04	266 20.3	266 40.5	38.9	0 43.5	34.6	197 00.9	38.7	208 27.6	21.7
05	281 22.8	281 42.9	38.2	15 45.3	34.8	212 02.8	38.8	223 29.8	21.7
06	296 25.3	296 45.4	N 4 37.6	30 47.1	S23 34.9	227 04.7	N21 38.8	238 32.0	N18 21.8
M 07	311 27.7	311 47.8	37.0	45 48.9	35.0	242 06.7	38.9	253 34.1	21.9
I 08	326 30.2	326 50.2	36.4	60 50.7	35.1	257 08.6	39.0	268 36.3	22.0
E 09	341 32.6	341 52.6	. . 35.8	75 52.5	. . 35.2	272 10.5	. . 39.1	283 38.5	. . 22.0
R 10	356 35.1	356 55.0	35.2	90 54.3	35.3	287 12.5	39.1	298 40.6	22.1
C 11	11 37.6	11 57.4	34.6	105 56.1	35.4	302 14.4	39.2	313 42.8	22.2
O 12	26 40.0	26 59.8	N 4 34.0	120 57.9	S23 35.5	317 16.3	N21 39.3	328 45.0	N18 22.2
L 13	41 42.5	42 02.2	33.4	135 59.7	35.6	332 18.3	39.4	343 47.1	22.3
E 14	56 45.0	57 04.5	32.9	151 01.5	35.7	347 20.2	39.4	358 49.3	22.4
S 15	71 47.4	72 06.9	. . 32.3	166 03.3	. . 35.8	2 22.1	. . 39.5	13 51.4	. . 22.4
16	86 49.9	87 09.3	31.7	181 05.1	35.9	17 24.1	39.6	28 53.6	22.5
17	101 52.4	102 11.7	31.1	196 06.9	36.0	32 26.0	39.7	43 55.8	22.6
18	116 54.8	117 14.0	N 4 30.5	211 08.7	S23 36.2	47 27.9	N21 39.7	58 57.9	N18 22.6
19	131 57.3	132 16.4	29.9	226 10.5	36.3	62 29.9	39.8	74 00.1	22.7
20	146 59.8	147 18.8	29.3	241 12.3	36.4	77 31.8	39.9	89 02.3	22.8
21	162 02.2	162 21.1	. . 28.8	256 14.1	. . 36.5	92 33.7	. . 40.0	104 04.4	. . 22.8
22	177 04.7	177 23.5	28.2	271 16.0	36.6	107 35.7	40.0	119 06.6	22.9
23	192 07.1	192 25.8	27.6	286 17.8	36.7	122 37.6	40.1	134 08.8	23.0
Pas. Mer.	h m 10 17.6	*v* 2.5	*d* 0.6	*v* 1.8	*d* 0.1	*v* 1.9	*d* 0.1	*v* 2.2	*d* 0.1

ESTRELLAS		
Nombre	A.H.S.	Dec.
	° ′	° ′
Acamar	315 26.0	S40 18.2
Achernar	335 34.4	S57 14.0
Acrux	173 19.5	S63 06.4
Adhara	255 20.1	S28 58.7
Aldebaran	291 00.6	N16 3..6
Alioth	166 28.4	N55 57.3
Alkaid	153 05.9	N49 18.5
Al Na'ir	27 55.9	S46 57.3
Alnilam	275 56.3	S 1 12.2
Alphard	218 05.4	S 8 39.9
Alphecca	126 18.8	N26 42.5
Alpheratz	357 53.8	N29 05.6
Altair	62 17.5	N 8 52.1
Ankaa	353 25.5	S42 18.1
Antares	112 37.7	S26 26.0
Arcturus	146 04.1	N19 10.5
Atria	107 47.9	S69 01.6
Avior	234 21.9	S59 31.1
Bellatrix	278 42.5	N 6 20.9
Betelgeuse	271 11.8	N 7 24.3
Canopus	264 00.6	S52 42.1
Capella	280 48.9	N46 00.0
Deneb	49 38.1	N45 16.7
Denebola	182 43.1	N14 33.9
Diphda	349 05.8	S17 59.0
Dubhe	194 02.8	N61 44.9
Elnath	278 24.9	N28 36.5
Eltanin	90 50.3	N51 29.1
Enif	33 56.7	N 9 52.6
Fomalhaut	15 34.7	S29 37.0
Gacrux	172 11.2	S57 07.3
Gienah	176 01.9	S17 33.0
Hadar	149 01.0	S60 22.7
Hamal	328 11.9	N23 27.9
Kaus Aust.	83 56.3	S34 23.0
Kochab	137 18.4	N74 09.0
Markab	13 48.1	N15 12.5
Menkar	314 25.4	N 4 05.5
Menkent	148 18.5	S36 22.6
Miaplacidus	221 41.5	S69 43.6
Mirfak	308 54.6	N49 51.9
Nunki	76 10.1	S26 17.7
Peacock	53 34.3	S56 43.7
Pollux	243 39.4	N28 01.5
Procyon	245 09.8	N 5 13.2
Rasalhague	96 15.1	N12 33.4
Regulus	207 53.5	N11 57.7
Rigel	281 21.5	S 8 12.2
Rigil Kent.	140 04.4	S60 50.3
Sabik	102 23.3	S15 43.6
Schedar	349 52.1	N56 32.4
Shaula	96 34.7	S37 06.2
Sirius	258 42.3	S16 43.3
Spica	158 41.0	S11 10.1
Suhail	222 59.4	S43 26.5
Vega	80 45.3	N38 46.8
Zuben'ubi	137 15.7	S16 02.8

	A.H.S.	Pas. Mer.
	° ′	h m
Venus	0 19.9	10 16
Marte	94 42.2	4 00
Júpiter	290 55.3	14 54
Saturno	302 15.7	14 08

T.U.	SOL				LUNA						
	A.H.G.		Dec.		A.H.G.	v	Dec.	d	P.H.		
d h	°	′	°	′	°	′	′	°	′	′	′
16 00	180	02.1	N10	03.9	261	42.6	11.8	S21	54.3	3.9	54.3
01	195	02.2		04.8	276	13.4	11.8	21	50.4	4.1	54.3
02	210	02.4		05.7	290	44.2	11.8	21	46.3	4.2	54.3
03	225	02.5	. .	06.6	305	15.0	11.9	21	42.1	4.3	54.3
04	240	02.7		07.5	319	45.9	11.9	21	37.8	4.3	54.3
05	255	02.8		08.4	334	16.8	12.0	21	33.5	4.5	54.3
06	270	03.0	N10	09.3	348	47.8	12.0	S21	29.0	4.6	54.3
07	285	03.1		10.1	3	18.8	12.0	21	24.4	4.6	54.3
L 08	300	03.3		11.0	17	49.8	12.1	21	19.8	4.8	54.3
09	315	03.4	. .	11.9	32	20.9	12.1	21	15.0	4.9	54.3
U 10	330	03.6		12.8	46	52.0	12.2	21	10.1	4.9	54.3
11	345	03.7		13.7	61	23.2	12.2	21	05.2	5.1	54.3
N 12	0	03.9	N10	14.6	75	54.4	12.2	S21	00.1	5.1	54.3
E 13	15	04.0		15.5	90	25.6	12.3	20	55.0	5.2	54.3
14	30	04.2		16.3	104	56.9	12.4	20	49.8	5.4	54.2
S 15	45	04.3	. .	17.2	119	28.3	12.3	20	44.4	5.4	54.2
16	60	04.4		18.1	133	59.6	12.4	20	39.0	5.5	54.2
17	75	04.6		19.0	148	31.0	12.5	20	33.5	5.6	54.2
18	90	04.7	N10	19.9	163	02.5	12.5	S20	27.9	5.7	54.2
19	105	04.9		20.7	177	34.0	12.5	20	22.2	5.8	54.2
20	120	05.0		21.6	192	05.5	12.6	20	16.4	5.8	54.2
21	135	05.2	. .	22.5	206	37.1	12.6	20	10.6	6.0	54.2
22	150	05.3		23.4	221	08.7	12.6	20	04.6	6.1	54.2
23	165	05.5		24.3	235	40.3	12.7	19	58.5	6.1	54.2
17 00	180	05.6	N10	25.2	250	12.0	12.8	S19	52.4	6.2	54.2
01	195	05.8		26.0	264	43.8	12.7	19	46.2	6.4	54.2
02	210	05.9		26.9	279	15.5	12.8	19	39.8	6.4	54.2
03	225	06.0	. .	27.8	293	47.3	12.9	19	33.4	6.4	54.2
04	240	06.2		28.7	308	19.2	12.9	19	27.0	6.6	54.2
05	255	06.3		29.6	322	51.1	12.9	19	20.4	6.7	54.2
06	270	06.5	N10	30.4	337	23.0	13.0	S19	13.7	6.7	54.2
07	285	06.6		31.3	351	55.0	13.0	19	07.0	6.9	54.2
M 08	300	06.8		32.2	6	27.0	13.1	19	00.1	6.9	54.2
A 09	315	06.9	. .	33.1	20	59.1	13.1	18	53.2	7.0	54.2
10	330	07.0		33.9	35	31.2	13.1	18	46.2	7.1	54.2
R 11	345	07.2		34.8	50	03.3	13.2	18	39.1	7.1	54.2
T 12	0	07.3	N10	35.7	64	35.5	13.2	S18	32.0	7.3	54.2
13	15	07.5		36.6	79	07.7	13.3	18	24.7	7.3	54.2
E 14	30	07.6		37.5	93	40.0	13.2	18	17.4	7.4	54.2
15	45	07.8	. .	38.3	108	12.2	13.4	18	10.0	7.5	54.2
S 16	60	07.9		39.2	122	44.6	13.3	18	02.5	7.5	54.2
17	75	08.0		40.1	137	16.9	13.4	17	55.0	7.7	54.2
18	90	08.2	N10	41.0	151	49.3	13.5	S17	47.3	7.7	54.2
19	105	08.3		41.8	166	21.8	13.5	17	39.6	7.8	54.2
20	120	08.5		42.7	180	54.3	13.5	17	31.8	7.9	54.2
21	135	08.6	. .	43.6	195	26.8	13.5	17	23.9	7.9	54.2
22	150	08.7		44.5	209	59.3	13.6	17	16.0	8.0	54.2
23	165	08.9		45.3	224	31.9	13.6	17	08.0	8.1	54.2
18 00	180	09.0	N10	46.2	239	04.5	13.7	S16	59.9	8.2	54.3
01	195	09.2		47.1	253	37.2	13.7	16	51.7	8.3	54.3
02	210	09.3		48.0	268	09.9	13.7	16	43.4	8.3	54.3
03	225	09.4	. .	48.8	282	42.6	13.8	16	35.1	8.4	54.3
04	240	09.6		49.7	297	15.4	13.8	16	26.7	8.4	54.3
05	255	09.7		50.6	311	48.2	13.8	16	18.3	8.6	54.3
06	270	09.9	N10	51.4	326	21.0	13.9	S16	09.7	8.6	54.3
M 07	285	10.0		52.3	340	53.9	13.9	16	01.1	8.7	54.3
I 08	300	10.1		53.2	355	26.8	13.9	15	52.4	8.7	54.3
E 09	315	10.3	. .	54.1	9	59.7	14.0	15	43.7	8.8	54.3
R 10	330	10.4		54.9	24	32.7	14.0	15	34.9	8.9	54.3
C 11	345	10.6		55.8	39	05.7	14.0	15	26.0	9.0	54.3
O 12	0	10.7	N10	56.7	53	38.7	14.1	S15	17.0	9.0	54.3
L 13	15	10.8		57.5	68	11.8	14.1	15	08.0	9.1	54.3
E 14	30	11.0		58.4	82	44.9	14.1	14	58.9	9.2	54.4
S 15	45	11.1	10	59.3	97	18.0	14.1	14	49.7	9.2	54.4
16	60	11.3	11	00.1	111	51.1	14.2	14	40.5	9.3	54.4
17	75	11.4		01.0	126	24.3	14.2	14	31.2	9.3	54.4
18	90	11.5	N11	01.9	140	57.5	14.2	S14	21.9	9.5	54.4
19	105	11.7		02.8	155	30.7	14.3	14	12.4	9.4	54.4
20	120	11.8		03.6	170	04.0	14.3	14	03.0	9.6	54.4
21	135	11.9	. .	04.5	184	37.3	14.3	13	53.4	9.6	54.4
22	150	12.1		05.4	199	10.6	14.4	13	43.8	9.7	54.4
23	165	12.2		06.2	213	44.0	14.3	S13	34.1	9.7	54.4
	SD	16.0	d	0.9	SD		14.8		14.8		14.8

Lat.	Crepúsculo Náutico	Crepúsculo Civil	Orto Sol	Orto Luna 16	Orto Luna 17	Orto Luna 18	Orto Luna 19
°	h m	h m	h m	h m	h m	h m	h m
N 72	////	01 37	03 27	▬	▬	06 29	05 50
N 70	////	02 20	03 46	▬	06 27	05 48	05 28
68	////	02 48	04 00	05 58	05 32	05 20	05 11
66	01 24	03 09	04 12	04 55	04 58	04 58	04 57
64	02 02	03 26	04 22	04 20	04 34	04 41	04 46
62	02 28	03 39	04 30	03 55	04 14	04 27	04 36
60	02 48	03 51	04 38	03 35	03 58	04 15	04 27
N 58	03 04	04 00	04 44	03 19	03 45	04 05	04 20
56	03 17	04 09	04 50	03 05	03 33	03 55	04 13
54	03 28	04 16	04 55	02 52	03 23	03 47	04 07
52	03 38	04 23	04 59	02 42	03 14	03 40	04 02
50	03 46	04 29	05 03	02 32	03 06	03 34	03 57
45	04 04	04 41	05 12	02 12	02 48	03 19	03 47
N 40	04 17	04 51	05 19	01 56	02 34	03 08	03 38
35	04 28	04 59	05 26	01 42	02 22	02 58	03 30
30	04 37	05 06	05 31	01 30	02 11	02 49	03 24
20	04 52	05 18	05 40	01 09	01 53	02 34	03 12
N 10	05 02	05 27	05 49	00 51	01 37	02 20	03 02
0	05 11	05 35	05 56	00 35	01 22	02 08	02 52
S 10	05 18	05 42	06 04	00 18	01 07	01 55	02 43
20	05 23	05 49	06 11	00 00	00 51	01 42	02 32
30	05 28	05 56	06 20	24 33	00 33	01 27	02 21
35	05 30	06 00	06 25	24 22	00 22	01 18	02 14
40	05 32	06 03	06 31	24 09	00 09	01 07	02 06
45	05 33	06 08	06 37	23 55	24 55	00 55	01 57
S 50	05 35	06 12	06 45	23 37	24 41	00 41	01 46
52	05 35	06 14	06 49	23 28	24 34	00 34	01 41
54	05 36	06 17	06 53	23 19	24 26	00 26	01 35
56	05 36	06 19	06 57	23 08	24 17	00 17	01 29
58	05 36	06 22	07 02	22 56	24 08	00 08	01 22
S 60	05 36	06 25	07 08	22 41	23 57	25 14	01 14

Lat.	Ocaso Sol	Crepúsculo Civil	Crepúsculo Náutico	Ocaso Luna 16	Ocaso Luna 17	Ocaso Luna 18	Ocaso Luna 19
°	h m	h m	h m	h m	h m	h m	h m
N 72	20 36	22 32	////	▬	▬	10 25	12 36
N 70	20 17	21 45	////	▬	08 52	11 05	12 56
68	20 01	21 15	////	07 42	09 46	11 32	13 12
66	19 49	20 53	22 44	08 44	10 19	11 52	13 24
64	19 39	20 36	22 02	09 19	10 42	12 09	13 35
62	19 31	20 22	21 35	09 44	11 01	12 22	13 44
60	19 23	20 10	21 14	10 03	11 17	12 33	13 51
N 58	19 17	20 00	20 58	10 19	11 30	12 43	13 58
56	19 11	19 52	20 44	10 33	11 41	12 52	14 04
54	19 06	19 44	20 33	10 45	11 51	12 59	14 09
52	19 01	19 37	20 23	10 55	11 59	13 06	14 14
50	18 57	19 31	20 14	11 05	12 07	13 12	14 18
45	18 48	19 19	19 56	11 24	12 24	13 25	14 27
N 40	18 40	19 09	19 43	11 40	12 37	13 36	14 35
35	18 34	19 00	19 31	11 53	12 49	13 45	14 41
30	18 28	18 53	19 22	12 05	12 59	13 53	14 47
20	18 19	18 41	19 08	12 25	13 16	14 06	14 57
N 10	18 11	18 32	18 57	12 42	13 31	14 18	15 05
0	18 03	18 24	18 48	12 58	13 44	14 30	15 13
S 10	17 55	18 17	18 41	13 14	13 58	14 41	15 21
20	17 47	18 10	18 35	13 31	14 13	14 52	15 30
30	17 38	18 03	18 31	13 50	14 30	15 06	15 39
35	17 33	17 59	18 28	14 02	14 39	15 13	15 45
40	17 28	17 55	18 27	14 15	14 50	15 22	15 51
45	17 21	17 51	18 25	14 30	15 03	15 32	15 58
S 50	17 13	17 46	18 23	14 48	15 19	15 44	16 06
52	17 09	17 44	18 23	14 57	15 26	15 50	16 10
54	17 05	17 41	18 22	15 07	15 34	15 56	16 15
56	17 01	17 39	18 22	15 18	15 44	16 03	16 19
58	16 56	17 36	18 22	15 31	15 54	16 11	16 25
S 60	16 50	17 33	18 22	15 46	16 06	16 20	16 31

Día	SOL E.T. (+) 00h	SOL E.T. (+) 12h	SOL Pas. Mer.	LUNA Pas. Sup.	LUNA Mer. Inf.	LUNA Edad	LUNA Fase
d	m s	m s	h m	h m	h m	d	%
16	00 08	00 15	12 00	06 46	19 10	22	42
17	00 22	00 29	12 00	07 33	19 56	23	33
18	00 36	00 43	11 59	08 19	20 41	24	24

T.U.	ARIES	VENUS −4.5		MARTE −0.7		JUPITER −2.0		SATURNO +0.2	
	A.H.G.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
19 00	207 09.6	207 28.2	N 4 27.0	301 19.6	S23 36.8	137 39.5	N21 40.2	149 10.9	N18 23.0
01	222 12.1	222 30.5	26.5	316 21.4	36.9	152 41.4	40.3	164 13.1	23.1
02	237 14.5	237 32.8	25.9	331 23.2	37.0	167 43.4	40.3	179 15.2	23.2
03	252 17.0	252 35.2 . .	25.3	346 25.0 . .	37.1	182 45.3 . .	40.4	194 17.4 . .	23.2
04	267 19.5	267 37.5	24.8	1 26.8	37.2	197 47.2	40.5	209 19.6	23.3
05	282 21.9	282 39.8	24.2	16 28.7	37.3	212 49.2	40.6	224 21.7	23.4
06	297 24.4	297 42.2	N 4 23.6	31 30.5	S23 37.4	227 51.1	N21 40.6	239 23.9	N18 23.4
07	312 26.9	312 44.5	23.1	46 32.3	37.6	242 53.0	40.7	254 26.1	23.5
J 08	327 29.3	327 46.8	22.5	61 34.1	37.7	257 55.0	40.8	269 28.2	23.6
U 09	342 31.8	342 49.1 . .	22.0	76 36.0 . .	37.8	272 56.9 . .	40.9	284 30.4 . .	23.7
E 10	357 34.2	357 51.4	21.4	91 37.8	37.9	287 58.8	41.0	299 32.5	23.7
V 11	12 36.7	12 53.7	20.8	106 39.6	38.0	303 00.7	41.0	314 34.7	23.8
12	27 39.2	27 56.0	N 4 20.3	121 41.4	S23 38.1	318 02.7	N21 41.1	329 36.9	N18 23.9
E 13	42 41.6	42 58.3	19.7	136 43.3	38.2	333 04.6	41.2	344 39.0	23.9
14	57 44.1	58 00.6	19.2	151 45.1	38.3	348 06.5	41.3	359 41.2	24.0
S 15	72 46.6	73 02.9 . .	18.7	166 46.9 . .	38.4	3 08.5 . .	41.3	14 43.4 . .	24.1
16	87 49.0	88 05.2	18.1	181 48.7	38.5	18 10.4	41.4	29 45.5	24.1
17	102 51.5	103 07.5	17.6	196 50.6	38.6	33 12.3	41.5	44 47.7	24.2
18	117 54.0	118 09.8	N 4 17.0	211 52.4	S23 38.7	48 14.2	N21 41.6	59 49.8	N18 24.3
19	132 56.4	133 12.0	16.5	226 54.2	38.8	63 16.2	41.6	74 52.0	24.3
20	147 58.9	148 14.3	15.9	241 56.1	39.0	78 18.1	41.7	89 54.2	24.4
21	163 01.4	163 16.6 . .	15.4	256 57.9 . .	39.1	93 20.0 . .	41.8	104 56.3 . .	24.5
22	178 03.8	178 18.8	14.9	271 59.8	39.2	108 22.0	41.9	119 58.5	24.5
23	193 06.3	193 21.1	14.3	287 01.6	39.3	123 23.9	41.9	135 00.6	24.6
20 00	208 08.7	208 23.3	N 4 13.8	302 03.4	S23 39.4	138 25.8	N21 42.0	150 02.8	N18 24.7
01	223 11.2	223 25.6	13.3	317 05.3	39.5	153 27.7	42.1	165 05.0	24.7
02	238 13.7	238 27.8	12.8	332 07.1	39.6	168 29.7	42.2	180 07.1	24.8
03	253 16.1	253 30.1 . .	12.2	347 08.9 . .	39.7	183 31.6 . .	42.2	195 09.3 . .	24.9
04	268 18.6	268 32.3	11.7	2 10.8	39.8	198 33.5	42.3	210 11.4	24.9
05	283 21.1	283 34.6	11.2	17 12.6	39.9	213 35.5	42.4	225 13.6	25.0
06	298 23.5	298 36.8	N 4 10.7	32 14.5	S23 40.0	228 37.4	N21 42.5	240 15.8	N18 25.1
07	313 26.0	313 39.0	10.2	47 16.3	40.1	243 39.3	42.5	255 17.9	25.1
V 08	328 28.5	328 41.3	09.6	62 18.2	40.3	258 41.2	42.6	270 20.1	25.2
I 09	343 30.9	343 43.5 . .	09.1	77 20.0 . .	40.4	273 43.2 . .	42.7	285 22.3 . .	25.3
E 10	358 33.4	358 45.7	08.6	92 21.9	40.5	288 45.1	42.8	300 24.4	25.4
R 11	13 35.8	13 47.9	08.1	107 23.7	40.6	303 47.0	42.8	315 26.6	25.4
N 12	28 38.3	28 50.1	N 4 07.6	122 25.6	S23 40.7	318 48.9	N21 42.9	330 28.7	N18 25.5
E 13	43 40.8	43 52.3	07.1	137 27.4	40.8	333 50.9	43.0	345 30.9	25.6
14	58 43.2	58 54.5	06.6	152 29.3	40.9	348 52.8	43.1	0 33.1	25.6
S 15	73 45.7	73 56.7 . .	06.1	167 31.1 . .	41.0	3 54.7 . .	43.1	15 35.2 . .	25.7
16	88 48.2	88 58.9	05.6	182 33.0	41.1	18 56.6	43.2	30 37.4	25.8
17	103 50.6	104 01.1	05.1	197 34.8	41.2	33 58.6	43.3	45 39.5	25.8
18	118 53.1	119 03.3	N 4 04.6	212 36.7	S23 41.3	49 00.5	N21 43.4	60 41.7	N18 25.9
19	133 55.6	134 05.5	04.1	227 38.5	41.4	64 02.4	43.4	75 43.8	26.0
20	148 58.0	149 07.7	03.6	242 40.4	41.5	79 04.3	43.5	90 46.0	26.0
21	164 00.5	164 09.9 . .	03.1	257 42.3 . .	41.7	94 06.3 . .	43.6	105 48.2 . .	26.1
22	179 03.0	179 12.1	02.6	272 44.1	41.8	109 08.2	43.7	120 50.3	26.2
23	194 05.4	194 14.2	02.1	287 46.0	41.9	124 10.1	43.7	135 52.5	26.2
21 00	209 07.9	209 16.4	N 4 01.7	302 47.8	S23 42.0	139 12.0	N21 43.8	150 54.6	N18 26.3
01	224 10.3	224 18.6	01.2	317 49.7	42.1	154 14.0	43.9	165 56.8	26.4
02	239 12.8	239 20.7	00.7	332 51.6	42.2	169 15.9	44.0	180 59.0	26.4
03	254 15.3	254 22.9	4 00.2	347 53.4 . .	42.3	184 17.8 . .	44.0	196 01.1 . .	26.5
04	269 17.7	269 25.0	3 59.7	2 55.3	42.4	199 19.7	44.1	211 03.3	26.6
05	284 20.2	284 27.2	59.3	17 57.2	42.5	214 21.7	44.2	226 05.4	26.6
06	299 22.7	299 29.3	N 3 58.8	32 59.0	S23 42.6	229 23.6	N21 44.3	241 07.6	N18 26.7
07	314 25.1	314 31.5	58.3	48 00.9	42.7	244 25.5	44.3	256 09.8	26.8
S 08	329 27.6	329 33.6	57.8	63 02.8	42.8	259 27.4	44.4	271 11.9	26.8
A 09	344 30.1	344 35.7 . .	57.4	78 04.6 . .	43.0	274 29.4 . .	44.5	286 14.1 . .	26.9
B 10	359 32.5	359 37.9	56.9	93 06.5	43.1	289 31.3	44.6	301 16.2	27.0
A 11	14 35.0	14 40.0	56.4	108 08.4	43.2	304 33.2	44.6	316 18.4	27.1
12	29 37.4	29 42.1	N 3 56.0	123 10.3	S23 43.3	319 35.1	N21 44.7	331 20.6	N18 27.1
D 13	44 39.9	44 44.3	55.5	138 12.1	43.4	334 37.0	44.8	346 22.7	27.2
14	59 42.4	59 46.4	55.0	153 14.0	43.5	349 39.0	44.9	1 24.9	27.3
O 15	74 44.8	74 48.5 . .	54.6	168 15.9 . .	43.6	4 40.9 . .	44.9	16 27.0 . .	27.3
16	89 47.3	89 50.6	54.1	183 17.8	43.7	19 42.8	45.0	31 29.2	27.4
17	104 49.8	104 52.7	53.7	198 19.7	43.8	34 44.7	45.1	46 31.3	27.5
18	119 52.2	119 54.8	N 3 53.2	213 21.5	S23 43.9	49 46.7	N21 45.2	61 33.5	N18 27.5
19	134 54.7	134 56.9	52.8	228 23.4	44.0	64 48.6	45.2	76 35.7	27.6
20	149 57.2	149 59.0	52.3	243 25.3	44.2	79 50.5	45.3	91 37.8	27.7
21	164 59.6	165 01.1 . .	51.9	258 27.2 . .	44.3	94 52.4 . .	45.4	106 40.0 . .	27.7
22	180 02.1	180 03.2	51.4	273 29.1	44.4	109 54.3	45.5	121 42.1	27.8
23	195 04.6	195 05.3	51.0	288 31.0	44.5	124 56.3	45.5	136 44.3	27.9
	h m								
Pas. Mer.	10 05.8	*v* 2.2	*d* 0.5	*v* 1.9	*d* 0.1	*v* 1.9	*d* 0.1	*v* 2.2	*d* 0.1

ESTRELLAS

Nombre	A.H.S.	Dec.
	° ′	° ′
Acamar	315 26.0	S40 18.2
Achernar	335 34.4	S57 14.0
Acrux	173 19.5	S63 06.4
Adhara	255 20.2	S28 58.7
Aldebaran	291 00.6	N16 30.6
Alioth	166 28.4	N55 57.3
Alkaid	153 05.9	N49 18.5
Al Na'ir	27 55.9	S46 57.3
Alnilam	275 56.3	S 1 12.2
Alphard	218 05.4	S 8 39.9
Alphecca	126 18.8	N26 42.6
Alpheratz	357 53.8	N29 05.6
Altair	62 17.5	N 8 52.1
Ankaa	353 25.5	S42 18.1
Antares	112 37.7	S26 26.0
Arcturus	146 04.1	N19 10.5
Atria	107 47.8	S69 01.6
Avior	234 21.9	S59 31.1
Bellatrix	278 42.5	N 6 20.9
Betelgeuse	271 11.8	N 7 24.3
Canopus	264 00.6	S52 42.1
Capella	280 48.9	N46 00.0
Deneb	49 38.1	N45 16.7
Denebola	182 43.1	N14 33.9
Diphda	349 05.8	S17 59.0
Dubhe	194 02.8	N61 44.9
Elnath	278 25.0	N28 36.5
Eltanin	90 50.3	N51 29.1
Enif	33 56.6	N 9 52.6
Fomalhaut	15 34.7	S29 37.0
Gacrux	172 11.2	S57 07.3
Gienah	176 01.9	S17 33.0
Hadar	149 01.0	S60 22.7
Hamal	328 11.9	N23 27.9
Kaus Aust.	83 56.3	S34 23.0
Kochab	137 18.3	N74 09.0
Markab	13 48.1	N15 12.5
Menkar	314 25.4	N 4 05.5
Menkent	148 18.5	S36 22.6
Miaplacidus	221 41.6	S69 43.6
Mirfak	308 54.6	N49 51.9
Nunki	76 10.0	S26 17.7
Peacock	53 34.2	S56 43.7
Pollux	243 39.4	N28 01.5
Procyon	245 09.8	N 5 13.2
Rasalhague	96 15.1	N12 33.4
Regulus	207 53.5	N11 57.7
Rigel	281 21.5	S 8 12.2
Rigil Kent.	140 04.4	S60 50.3
Sabik	102 23.3	S15 43.6
Schedar	349 52.1	N56 32.4
Shaula	96 34.7	S37 06.2
Sirius	258 42.3	S16 43.3
Spica	158 41.0	S11 10.1
Suhail	222 59.4	S43 26.5
Vega	80 45.3	N38 46.8
Zuben'ubi	137 15.7	S16 02.8

	A.H.S.	Pas. Mer.
	° ′	h m
Venus	0 14.6	10 05
Marte	93 54.7	3 51
Júpiter	290 17.1	14 44
Saturno	301 54.1	13 58

T.U.	SOL				LUNA						
	A.H.G.		Dec.		A.H.G.	v	Dec.	d	P.H.		
d h	°	′	°	′	°	′	′	°	′	′	′
19 00	180	12.3	N11	07.1	228	17.3	14.4	S13	24.4	9.8	54.5
01	195	12.5		08.0	242	50.7	14.4	13	14.6	9.8	54.5
02	210	12.6		08.8	257	24.1	14.5	13	04.8	9.9	54.5
03	225	12.8	. .	09.7	271	57.6	14.4	12	54.9	10.0	54.5
04	240	12.9		10.5	286	31.0	14.5	12	44.9	10.0	54.5
05	255	13.0		11.4	301	04.5	14.5	12	34.9	10.1	54.5
06	270	13.2	N11	12.3	315	38.0	14.6	S12	24.8	10.2	54.5
07	285	13.3		13.1	330	11.6	14.5	12	14.6	10.2	54.5
J 08	300	13.4		14.0	344	45.1	14.6	12	04.4	10.2	54.5
U 09	315	13.6	. .	14.9	359	18.7	14.6	11	54.2	10.3	54.6
10	330	13.7		15.7	13	52.3	14.6	11	43.9	10.4	54.6
E 11	345	13.8		16.6	28	25.9	14.6	11	33.5	10.4	54.6
V 12	0	14.0	N11	17.5	42	59.5	14.7	S11	23.1	10.5	54.6
13	15	14.1		18.3	57	33.2	14.6	11	12.6	10.5	54.6
E 14	30	14.2		19.2	72	06.8	14.7	11	02.1	10.6	54.6
15	45	14.4	. .	20.0	86	40.5	14.7	10	51.5	10.6	54.6
S 16	60	14.5		20.9	101	14.2	14.7	10	40.9	10.7	54.7
17	75	14.6		21.8	115	47.9	14.8	10	30.2	10.7	54.7
18	90	14.8	N11	22.6	130	21.7	14.7	S10	19.5	10.8	54.7
19	105	14.9		23.5	144	55.4	14.8	10	08.7	10.8	54.7
20	120	15.0		24.3	159	29.2	14.7	9	57.9	10.9	54.7
21	135	15.2	. .	25.2	174	02.9	14.8	9	47.0	10.9	54.7
22	150	15.3		26.1	188	36.7	14.8	9	36.1	11.0	54.8
23	165	15.4		26.9	203	10.5	14.8	9	25.1	11.0	54.8
20 00	180	15.6	N11	27.8	217	44.3	14.9	S 9	14.1	11.0	54.8
01	195	15.7		28.6	232	18.2	14.8	9	03.1	11.1	54.8
02	210	15.8		29.5	246	52.0	14.8	8	52.0	11.2	54.8
03	225	16.0	. .	30.4	261	25.8	14.9	8	40.8	11.2	54.8
04	240	16.1		31.2	275	59.7	14.8	8	29.6	11.2	54.9
05	255	16.2		32.1	290	33.5	14.9	8	18.4	11.3	54.9
06	270	16.3	N11	32.9	305	07.4	14.9	S 8	07.1	11.3	54.9
07	285	16.5		33.8	319	41.3	14.8	7	55.8	11.4	54.9
V 08	300	16.6		34.6	334	15.1	14.9	7	44.4	11.4	54.9
I 09	315	16.7	. .	35.5	348	49.0	14.9	7	33.0	11.4	54.9
E 10	330	16.9		36.3	3	22.9	14.9	7	21.6	11.5	55.0
R 11	345	17.0		37.2	17	56.8	14.9	7	10.1	11.5	55.0
N 12	0	17.1	N11	38.1	32	30.7	14.9	S 6	58.6	11.6	55.0
E 13	15	17.3		38.9	47	04.6	14.8	6	47.0	11.6	55.0
S 14	30	17.4		39.8	61	38.4	14.9	6	35.4	11.6	55.0
15	45	17.5	. .	40.6	76	12.3	14.9	6	23.8	11.7	55.0
16	60	17.6		41.5	90	46.2	14.9	6	12.1	11.7	55.1
17	75	17.8		42.3	105	20.1	14.9	6	00.4	11.7	55.1
18	90	17.9	N11	43.2	119	54.0	14.9	S 5	48.7	11.8	55.1
19	105	18.0		44.0	134	27.9	14.9	5	36.9	11.8	55.1
20	120	18.2		44.9	149	01.8	14.9	5	25.1	11.8	55.1
21	135	18.3	. .	45.7	163	35.7	14.8	5	13.3	11.9	55.2
22	150	18.4		46.6	178	09.5	14.9	5	01.4	11.9	55.2
23	165	18.5		47.4	192	43.4	14.9	4	49.5	11.9	55.2
21 00	180	18.7	N11	48.3	207	17.3	14.8	S 4	37.6	11.9	55.2
01	195	18.8		49.1	221	51.1	14.9	4	25.7	12.0	55.2
02	210	18.9		50.0	236	25.0	14.8	4	13.7	12.0	55.3
03	225	19.0	. .	50.8	250	58.8	14.9	4	01.7	12.1	55.3
04	240	19.2		51.7	265	32.7	14.8	3	49.6	12.0	55.3
05	255	19.3		52.5	280	06.5	14.8	3	37.6	12.1	55.3
06	270	19.4	N11	53.4	294	40.3	14.8	S 3	25.5	12.1	55.3
07	285	19.5		54.2	309	14.1	14.8	3	13.4	12.2	55.4
S 08	300	19.7		55.1	323	47.9	14.8	3	01.2	12.1	55.4
A 09	315	19.8	. .	55.9	338	21.7	14.7	2	49.1	12.2	55.4
10	330	19.9		56.8	352	55.4	14.8	2	36.9	12.2	55.4
B 11	345	20.1		57.6	7	29.2	14.7	2	24.7	12.2	55.5
12	0	20.2	N11	58.5	22	02.9	14.7	S 2	12.5	12.3	55.5
A 13	15	20.3	11	59.3	36	36.6	14.7	2	00.2	12.2	55.5
14	30	20.4	12	00.2	51	10.3	14.7	1	48.0	12.3	55.5
D 15	45	20.5	. .	01.0	65	44.0	14.7	1	35.7	12.3	55.5
16	60	20.7		01.9	80	17.7	14.6	1	23.4	12.3	55.6
O 17	75	20.8		02.7	94	51.3	14.6	1	11.1	12.4	55.6
18	90	20.9	N12	03.5	109	24.9	14.6	S 0	58.7	12.3	55.6
19	105	21.0		04.4	123	58.5	14.6	0	46.4	12.4	55.6
20	120	21.2		05.2	138	32.1	14.6	0	34.0	12.3	55.7
21	135	21.3	. .	06.1	153	05.7	14.5	0	21.7	12.4	55.7
22	150	21.4		06.9	167	39.2	14.5	S 0	09.3	12.4	55.7
23	165	21.5		07.8	182	12.7	14.5	N 0	03.1	12.4	55.7
	SD	15.9	d	0.9	SD		14.9		15.0		15.1

Lat.	Crepúsculo Náutico	Crepúsculo Civil	Orto Sol	Orto Luna 19	Orto Luna 20	Orto Luna 21	Orto Luna 22
°	h m	h m	h m	h m	h m	h m	h m
N 72	////	00 55	03 09	05 50	05 26	05 06	04 47
N 70	////	01 57	03 31	05 28	05 13	05 01	04 49
68	////	02 31	03 47	05 11	05 04	04 57	04 50
66	00 48	02 55	04 00	04 57	04 55	04 53	04 51
64	01 42	03 13	04 11	04 46	04 48	04 50	04 52
62	02 13	03 28	04 21	04 36	04 42	04 48	04 53
60	02 35	03 41	04 29	04 27	04 37	04 46	04 54
N 58	02 53	03 52	04 36	04 20	04 32	04 44	04 54
56	03 07	04 01	04 42	04 13	04 28	04 42	04 55
54	03 19	04 09	04 48	04 07	04 24	04 40	04 55
52	03 30	04 16	04 53	04 02	04 21	04 39	04 56
50	03 39	04 22	04 57	03 57	04 18	04 37	04 56
45	03 58	04 36	05 07	03 47	04 11	04 34	04 57
N 40	04 12	04 47	05 15	03 38	04 05	04 32	04 58
35	04 24	04 56	05 22	03 30	04 01	04 30	04 59
30	04 34	05 03	05 28	03 24	03 56	04 28	04 59
20	04 49	05 16	05 38	03 12	03 49	04 24	05 00
N 10	05 01	05 26	05 47	03 02	03 42	04 22	05 01
0	05 10	05 34	05 56	02 52	03 36	04 19	05 02
S 10	05 18	05 42	06 04	02 43	03 29	04 16	05 03
20	05 24	05 50	06 12	02 32	03 23	04 13	05 04
30	05 30	05 58	06 22	02 21	03 15	04 10	05 05
35	05 32	06 02	06 28	02 14	03 11	04 08	05 06
40	05 35	06 06	06 34	02 06	03 06	04 06	05 07
45	05 37	06 11	06 41	01 57	03 00	04 03	05 08
S 50	05 39	06 17	06 50	01 46	02 53	04 00	05 09
52	05 40	06 19	06 54	01 41	02 49	03 59	05 10
54	05 41	06 22	06 58	01 35	02 46	03 57	05 10
56	05 41	06 25	07 03	01 29	02 42	03 56	05 11
58	05 42	06 28	07 09	01 22	02 37	03 54	05 12
S 60	05 43	06 31	07 15	01 14	02 32	03 52	05 12

Lat.	Ocaso Sol	Crepúsculo Civil	Crepúsculo Náutico	Ocaso Luna 19	Ocaso Luna 20	Ocaso Luna 21	Ocaso Luna 22
°	h m	h m	h m	h m	h m	h m	h m
N 72	20 53	23 24	////	12 36	14 31	16 22	18 14
N 70	20 31	22 08	////	12 56	14 41	16 24	18 09
68	20 14	21 32	////	13 12	14 49	16 26	18 04
66	20 00	21 06	23 29	13 24	14 56	16 27	18 00
64	19 48	20 47	22 22	13 35	15 01	16 28	17 57
62	19 39	20 32	21 49	13 44	15 06	16 29	17 54
60	19 31	20 19	21 26	13 51	15 10	16 30	17 51
N 58	19 23	20 08	21 08	13 58	15 14	16 31	17 49
56	19 17	19 59	20 53	14 04	15 17	16 31	17 47
54	19 11	19 50	20 40	14 09	15 20	16 32	17 46
52	19 06	19 43	20 30	14 14	15 23	16 33	17 44
50	19 02	19 37	20 20	14 18	15 25	16 33	17 43
45	18 52	19 23	20 01	14 27	15 30	16 34	17 40
N 40	18 43	19 12	19 46	14 35	15 34	16 35	17 37
35	18 36	19 03	19 34	14 41	15 38	16 36	17 35
30	18 30	18 55	19 24	14 47	15 41	16 36	17 33
20	18 20	18 42	19 09	14 57	15 47	16 38	17 29
N 10	18 11	18 32	18 57	15 05	15 52	16 39	17 26
0	18 02	18 23	18 48	15 13	15 56	16 40	17 24
S 10	17 54	18 15	18 40	15 21	16 01	16 40	17 21
20	17 45	18 08	18 33	15 30	16 06	16 41	17 18
30	17 35	18 00	18 28	15 39	16 11	16 42	17 14
35	17 30	17 55	18 25	15 45	16 14	16 43	17 12
40	17 23	17 51	18 22	15 51	16 18	16 44	17 10
45	17 16	17 46	18 20	15 58	16 22	16 44	17 08
S 50	17 07	17 40	18 18	16 06	16 26	16 45	17 05
52	17 03	17 38	18 17	16 10	16 29	16 46	17 03
54	16 59	17 35	18 16	16 15	16 31	16 46	17 02
56	16 54	17 32	18 15	16 19	16 34	16 47	17 00
58	16 48	17 29	18 15	16 25	16 36	16 47	16 58
S 60	16 42	17 25	18 14	16 31	16 40	16 48	16 56

Día	SOL E.T. (+) 00h	SOL E.T. (+) 12h	SOL Pas. Mer.	LUNA Pas. Sup.	LUNA Mer. Inf.	LUNA Edad	LUNA Fase
d	m s	m s	h m	h m	h m	d %	
19	00 49	00 56	11 59	09 03	21 25	25 17	
20	01 02	01 08	11 59	09 46	22 08	26 10	
21	01 14	01 20	11 59	10 29	22 51	27 5	

T.U.	ARIES	VENUS −4.5		MARTE −0.8		JUPITER −2.0		SATURNO +0.2	
d h	A.H.G.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.
	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
22 00	210 07.0	210 07.4	N 3 50.6	303 32.8	S23 44.6	139 58.2	N21 45.6	151 46.4	N18 27.9
01	225 09.5	225 09.4	50.1	318 34.7	44.7	155 00.1	45.7	166 48.6	28.0
02	240 11.9	240 11.5	49.7	333 36.6	44.8	170 02.0	45.8	181 50.8	28.1
03	255 14.4	255 13.6 . .	49.2	348 38.5 . .	44.9	185 03.9 . .	45.8	196 52.9 . .	28.1
04	270 16.9	270 15.6	48.8	3 40.4	45.0	200 05.9	45.9	211 55.1	28.2
05	285 19.3	285 17.7	48.4	18 42.3	45.1	215 07.8	46.0	226 57.2	28.3
06	300 21.8	300 19.8	N 3 47.9	33 44.2	S23 45.2	230 09.7	N21 46.1	241 59.4	N18 28.3
07	315 24.3	315 21.8	47.5	48 46.1	45.3	245 11.6	46.1	257 01.5	28.4
D 08	330 26.7	330 23.9	47.1	63 48.0	45.5	260 13.5	46.2	272 03.7	28.5
O 09	345 29.2	345 25.9 . .	46.7	78 49.9 . .	45.6	275 15.5 . .	46.3	287 05.9 . .	28.6
M 10	0 31.7	0 28.0	46.2	93 51.8	45.7	290 17.4	46.4	302 08.0	28.6
I 11	15 34.1	15 30.0	45.8	108 53.7	45.8	305 19.3	46.4	317 10.2	28.7
N 12	30 36.6	30 32.1	N 3 45.4	123 55.6	S23 45.9	320 21.2	N21 46.5	332 12.3	N18 28.8
G 13	45 39.1	45 34.1	45.0	138 57.5	46.0	335 23.1	46.6	347 14.5	28.8
O 14	60 41.5	60 36.1	44.6	153 59.4	46.1	350 25.1	46.7	2 16.6	28.9
15	75 44.0	75 38.2 . .	44.2	169 01.3 . .	46.2	5 27.0 . .	46.7	17 18.8 . .	29.0
16	90 46.4	90 40.2	43.7	184 03.2	46.3	20 28.9	46.8	32 21.0	29.0
17	105 48.9	105 42.2	43.3	199 05.1	46.4	35 30.8	46.9	47 23.1	29.1
18	120 51.4	120 44.2	N 3 42.9	214 07.0	S23 46.5	50 32.7	N21 47.0	62 25.3	N18 29.2
19	135 53.8	135 46.3	42.5	229 08.9	46.7	65 34.7	47.0	77 27.4	29.2
20	150 56.3	150 48.3	42.1	244 10.8	46.8	80 36.6	47.1	92 29.6	29.3
21	165 58.8	165 50.3 . .	41.7	259 12.7 . .	46.9	95 38.5 . .	47.2	107 31.7 . .	29.4
22	181 01.2	180 52.3	41.3	274 14.6	47.0	110 40.4	47.2	122 33.9	29.4
23	196 03.7	195 54.3	40.9	289 16.5	47.1	125 42.3	47.3	137 36.1	29.5
23 00	211 06.2	210 56.3	N 3 40.5	304 18.4	S23 47.2	140 44.2	N21 47.4	152 38.2	N18 29.6
01	226 08.6	225 58.3	40.1	319 20.3	47.3	155 46.2	47.5	167 40.4	29.6
02	241 11.1	241 00.3	39.7	334 22.3	47.4	170 48.1	47.5	182 42.5	29.7
03	256 13.5	256 02.3 . .	39.3	349 24.2 . .	47.5	185 50.0 . .	47.6	197 44.7 . .	29.8
04	271 16.0	271 04.2	38.9	4 26.1	47.6	200 51.9	47.7	212 46.8	29.8
05	286 18.5	286 06.2	38.6	19 28.0	47.7	215 53.8	47.8	227 49.0	29.9
06	301 20.9	301 08.2	N 3 38.2	34 29.9	S23 47.9	230 55.8	N21 47.8	242 51.1	N18 30.0
07	316 23.4	316 10.2	37.8	49 31.8	48.0	245 57.7	47.9	257 53.3	30.0
L 08	331 25.9	331 12.2	37.4	64 33.8	48.1	260 59.6	48.0	272 55.5	30.1
U 09	346 28.3	346 14.1 . .	37.0	79 35.7 . .	48.2	276 01.5 . .	48.1	287 57.6 . .	30.2
N 10	1 30.8	1 16.1	36.6	94 37.6	48.3	291 03.4	48.1	302 59.8	30.3
E 11	16 33.3	16 18.1	36.3	109 39.5	48.4	306 05.3	48.2	318 01.9	30.3
S 12	31 35.7	31 20.0	N 3 35.9	124 41.5	S23 48.5	321 07.3	N21 48.3	333 04.1	N18 30.4
13	46 38.2	46 22.0	35.5	139 43.4	48.6	336 09.2	48.4	348 06.2	30.5
14	61 40.7	61 23.9	35.1	154 45.3	48.7	351 11.1	48.4	3 08.4	30.5
15	76 43.1	76 25.9 . .	34.8	169 47.2 . .	48.8	6 13.0 . .	48.5	18 10.5 . .	30.6
16	91 45.6	91 27.8	34.4	184 49.2	49.0	21 14.9	48.6	33 12.7	30.7
17	106 48.0	106 29.8	34.0	199 51.1	49.1	36 16.8	48.7	48 14.8	30.7
18	121 50.5	121 31.7	N 3 33.7	214 53.0	S23 49.2	51 18.7	N21 48.7	63 17.0	N18 30.8
19	136 53.0	136 33.6	33.3	229 55.0	49.3	66 20.7	48.8	78 19.2	30.9
20	151 55.4	151 35.6	33.0	244 56.9	49.4	81 22.6	48.9	93 21.3	30.9
21	166 57.9	166 37.5 . .	32.6	259 58.8 . .	49.5	96 24.5 . .	49.0	108 23.5 . .	31.0
22	182 00.4	181 39.4	32.2	275 00.8	49.6	111 26.4	49.0	123 25.6	31.1
23	197 02.8	196 41.3	31.9	290 02.7	49.7	126 28.3	49.1	138 27.8	31.1
24 00	212 05.3	211 43.2	N 3 31.5	305 04.6	S23 49.8	141 30.2	N21 49.2	153 29.9	N18 31.2
01	227 07.8	226 45.2	31.2	320 06.6	49.9	156 32.2	49.2	168 32.1	31.3
02	242 10.2	241 47.1	30.8	335 08.5	50.1	171 34.1	49.3	183 34.2	31.3
03	257 12.7	256 49.0 . .	30.5	350 10.4 . .	50.2	186 36.0 . .	49.4	198 36.4 . .	31.4
04	272 15.1	271 50.9	30.1	5 12.4	50.3	201 37.9	49.5	213 38.5	31.5
05	287 17.6	286 52.8	29.8	20 14.3	50.4	216 39.8	49.5	228 40.7	31.5
06	302 20.1	301 54.7	N 3 29.5	35 16.3	S23 50.5	231 41.7	N21 49.6	243 42.9	N18 31.6
07	317 22.5	316 56.6	29.1	50 18.2	50.6	246 43.6	49.7	258 45.0	31.7
M 08	332 25.0	331 58.5	28.8	65 20.2	50.7	261 45.6	49.8	273 47.2	31.7
A 09	347 27.5	347 00.4 . .	28.4	80 22.1 . .	50.8	276 47.5 . .	49.8	288 49.3 . .	31.8
R 10	2 29.9	2 02.2	28.1	95 24.1	50.9	291 49.4	49.9	303 51.5	31.9
T 11	17 32.4	17 04.1	27.8	110 26.0	51.0	306 51.3	50.0	318 53.6	32.0
E 12	32 34.9	32 06.0	N 3 27.4	125 28.0	S23 51.2	321 53.2	N21 50.1	333 55.8	N18 32.0
13	47 37.3	47 07.9	27.1	140 29.9	51.3	336 55.1	50.1	348 57.9	32.1
S 14	62 39.8	62 09.8	26.8	155 31.9	51.4	351 57.0	50.2	4 00.1	32.2
15	77 42.3	77 11.6 . .	26.5	170 33.8 . .	51.5	6 58.9 . .	50.3	19 02.2 . .	32.2
16	92 44.7	92 13.5	26.1	185 35.8	51.6	22 00.9	50.4	34 04.4	32.3
17	107 47.2	107 15.3	25.8	200 37.7	51.7	37 02.8	50.4	49 06.5	32.4
18	122 49.6	122 17.2	N 3 25.5	215 39.7	S23 51.8	52 04.7	N21 50.5	64 08.7	N18 32.4
19	137 52.1	137 19.1	25.2	230 41.6	51.9	67 06.6	50.6	79 10.8	32.5
20	152 54.6	152 20.9	24.9	245 43.6	52.0	82 08.5	50.6	94 13.0	32.6
21	167 57.0	167 22.8 . .	24.5	260 45.6 . .	52.2	97 10.4 . .	50.7	109 15.2 . .	32.6
22	182 59.5	182 24.6	24.2	275 47.5	52.3	112 12.3	50.8	124 17.3	32.7
23	198 02.0	197 26.5	23.9	290 49.5	52.4	127 14.2	50.9	139 19.5	32.8
Pas. Mer.	h m 9 54.0	v 2.0	d 0.4	v 1.9	d 0.1	v 1.9	d 0.1	v 2.2	d 0.1

ESTRELLAS

Nombre	A.H.S.	Dec.
	° ′	° ′
Acamar	315 26.0	S40 18.2
Achernar	335 34.4	S57 13.9
Acrux	173 19.5	S63 06.5
Adhara	255 20.2	S28 58.7
Aldebaran	291 00.7	N16 30.6
Alioth	166 28.4	N55 57.3
Alkaid	153 05.9	N49 18.5
Al Na'ir	27 55.8	S46 57.2
Alnilam	275 56.3	S 1 12.2
Alphard	218 05.4	S 8 39.9
Alphecca	126 18.7	N26 42.6
Alpheratz	357 53.7	N29 05.6
Altair	62 17.5	N 8 52.1
Ankaa	353 25.4	S42 18.0
Antares	112 37.7	S26 26.0
Arcturus	146 04.1	N19 10.5
Atria	107 47.8	S69 01.6
Avior	234 22.0	S59 31.1
Bellatrix	278 42.5	N 6 20.9
Betelgeuse	271 11.8	N 7 24.3
Canopus	264 00.7	S52 42.1
Capella	280 48.9	N46 00.0
Deneb	49 38.1	N45 16.7
Denebola	182 43.1	N14 33.9
Diphda	349 05.8	S17 59.0
Dubhe	194 02.8	N61 44.9
Elnath	278 25.0	N28 36.5
Eltanin	90 50.3	N51 29.1
Enif	33 56.6	N 9 52.6
Fomalhaut	15 34.7	S29 37.0
Gacrux	172 11.2	S57 07.3
Glenah	176 01.9	S17 33.0
Hadar	149 01.0	S60 22.7
Hamal	328 11.9	N23 27.9
Kaus Aust.	83 56.3	S34 23.0
Kochab	137 18.3	N74 09.0
Markab	13 48.1	N15 12.5
Menkar	314 25.4	N 4 05.5
Menkent	148 18.5	S36 22.6
Miaplacidus	221 41.6	S69 43.6
Mirfak	308 54.6	N49 51.8
Nunki	76 10.0	S26 17.7
Peacock	53 34.2	S56 43.7
Pollux	243 39.5	N28 01.5
Procyon	245 09.8	N 5 13.2
Rasalhague	96 15.1	N12 33.4
Regulus	207 53.5	N11 57.7
Rigel	281 21.5	S 8 12.2
Rigil Kent.	140 04.3	S60 50.3
Sabik	102 23.3	S15 43.6
Schedar	349 52.1	N56 32.4
Shaula	96 34.6	S37 06.2
Sirius	258 42.3	S16 43.2
Spica	158 41.0	S11 10.1
Suhail	222 59.4	S43 26.5
Vega	80 45.3	N38 46.8
Zuben'ubi	137 15.7	S16 02.8

	A.H.S.	Pas. Mer.
	° ′	h m
Venus	359 50.1	9 55
Marte	93 12.3	3 42
Júpiter	289 38.1	14 35
Saturno	301 32.1	13 47

T.U.	SOL				LUNA						
	A.H.G.		Dec.		A.H.G.	v		Dec.	d	P.H.	
d h	°	′	°	′	°	′	′	°	′	′	′
22 00	180	21.7	N12	08.6	196	46.2	14.5	N 0	15.5	12.4	55.7
01	195	21.8		09.4	211	19.7	14.4	0	27.9	12.5	55.8
02	210	21.9		10.3	225	53.1	14.4	0	40.4	12.4	55.8
03	225	22.0	. .	11.1	240	26.5	14.4	0	52.8	12.4	55.8
04	240	22.1		12.0	254	59.9	14.3	1	05.2	12.5	55.8
05	255	22.3		12.8	269	33.2	14.4	1	17.7	12.5	55.9
06	270	22.4	N12	13.6	284	06.6	14.3	N 1	30.2	12.4	55.9
07	285	22.5		14.5	298	39.9	14.2	1	42.6	12.5	55.9
D 08	300	22.6		15.3	313	13.1	14.2	1	55.1	12.4	55.9
O 09	315	22.8	. .	16.2	327	46.3	14.2	2	07.5	12.5	55.9
M 10	330	22.9		17.0	342	19.5	14.2	2	20.0	12.5	56.0
I 11	345	23.0		17.8	356	52.7	14.1	2	32.5	12.4	56.0
N 12	0	23.1	N12	18.7	11	25.8	14.1	N 2	44.9	12.5	56.0
G 13	15	23.2		19.5	25	58.9	14.0	2	57.4	12.5	56.0
O 14	30	23.4		20.4	40	31.9	14.1	3	09.9	12.4	56.1
15	45	23.5	. .	21.2	55	05.0	13.9	3	22.3	12.5	56.1
16	60	23.6		22.0	69	37.9	14.0	3	34.8	12.5	56.1
17	75	23.7		22.9	84	10.9	13.9	3	47.3	12.4	56.1
18	90	23.8	N12	23.7	98	43.8	13.8	N 3	59.7	12.5	56.2
19	105	23.9		24.5	113	16.6	13.8	4	12.2	12.4	56.2
20	120	24.1		25.4	127	49.4	13.8	4	24.6	12.4	56.2
21	135	24.2	. .	26.2	142	22.2	13.8	4	37.0	12.4	56.2
22	150	24.3		27.0	156	55.0	13.6	4	49.4	12.4	56.2
23	165	24.4		27.9	171	27.6	13.7	5	01.8	12.4	56.3
23 00	180	24.5	N12	28.7	186	00.3	13.6	N 5	14.2	12.4	56.3
01	195	24.7		29.5	200	32.9	13.5	5	26.6	12.4	56.3
02	210	24.8		30.4	215	05.4	13.5	5	39.0	12.3	56.3
03	225	24.9	. .	31.2	229	37.9	13.5	5	51.3	12.4	56.4
04	240	25.0		32.0	244	10.4	13.4	6	03.7	12.3	56.4
05	255	25.1		32.9	258	42.8	13.4	6	16.0	12.3	56.4
06	270	25.2	N12	33.7	273	15.2	13.3	N 6	28.3	12.3	56.4
07	285	25.4		34.5	287	47.5	13.2	6	40.6	12.3	56.5
L 08	300	25.5		35.4	302	19.7	13.3	6	52.9	12.2	56.5
U 09	315	25.6	. .	36.2	316	52.0	13.1	7	05.1	12.2	56.5
N 10	330	25.7		37.0	331	24.1	13.1	7	17.3	12.2	56.5
11	345	25.8		37.9	345	56.2	13.1	7	29.5	12.2	56.6
E 12	0	25.9	N12	38.7	0	28.3	13.0	N 7	41.7	12.2	56.6
13	15	26.0		39.5	15	00.3	12.9	7	53.9	12.1	56.6
S 14	30	26.2		40.4	29	32.2	12.9	8	06.0	12.1	56.6
15	45	26.3	. .	41.2	44	04.1	12.8	8	18.1	12.0	56.6
16	60	26.4		42.0	58	35.9	12.8	8	30.1	12.1	56.7
17	75	26.5		42.8	73	07.7	12.7	8	42.2	12.0	56.7
18	90	26.6	N12	43.7	87	39.4	12.7	N 8	54.2	12.0	56.7
19	105	26.7		44.5	102	11.1	12.6	9	06.2	11.9	56.7
20	120	26.8		45.3	116	42.7	12.5	9	18.1	11.9	56.8
21	135	27.0	. .	46.1	131	14.2	12.5	9	30.0	11.9	56.8
22	150	27.1		47.0	145	45.7	12.4	9	41.9	11.8	56.8
23	165	27.2		47.8	160	17.1	12.3	9	53.7	11.8	56.8
24 00	180	27.3	N12	48.6	174	48.4	12.3	N10	05.5	11.8	56.9
01	195	27.4		49.5	189	19.7	12.3	10	17.3	11.7	56.9
02	210	27.5		50.3	203	51.0	12.1	10	29.0	11.7	56.9
03	225	27.6	. .	51.1	218	22.1	12.1	10	40.7	11.6	56.9
04	240	27.8		51.9	232	53.2	12.0	10	52.3	11.6	56.9
05	255	27.9		52.7	247	24.2	12.0	11	03.9	11.6	57.0
06	270	28.0	N12	53.6	261	55.2	11.9	N11	15.5	11.5	57.0
07	285	28.1		54.4	276	26.1	11.8	11	27.0	11.4	57.0
M 08	300	28.2		55.2	290	56.9	11.8	11	38.4	11.4	57.0
A 09	315	28.3	. .	56.0	305	27.7	11.7	11	49.8	11.4	57.1
R 10	330	28.4		56.9	319	58.4	11.6	12	01.2	11.3	57.1
11	345	28.5		57.7	334	29.0	11.6	12	12.5	11.2	57.1
T 12	0	28.6	N12	58.5	348	59.6	11.5	N12	23.7	11.2	57.1
13	15	28.8	12	59.3	3	30.1	11.4	12	34.9	11.2	57.2
E 14	30	28.9	13	00.1	18	00.5	11.3	12	46.1	11.1	57.2
15	45	29.0	. .	01.0	32	30.8	11.3	12	57.2	11.0	57.2
S 16	60	29.1		01.8	47	01.1	11.2	13	08.2	11.0	57.2
17	75	29.2		02.6	61	31.3	11.2	13	19.2	10.9	57.2
18	90	29.3	N13	03.4	76	01.5	11.0	N13	30.1	10.9	57.3
19	105	29.4		04.2	90	31.5	11.0	13	41.0	10.8	57.3
20	120	29.5		05.1	105	01.5	10.9	13	51.8	10.7	57.3
21	135	29.6	. .	05.9	119	31.4	10.9	14	02.5	10.6	57.3
22	150	29.7		06.7	134	01.3	10.7	14	13.1	10.6	57.3
23	165	29.8		07.5	148	31.0	10.7	N14	23.7	10.6	57.4
	SD	15.9	d	0.8	SD		15.3		15.4		15.6

Lat.	Crepúsculo Náutico	Crepúsculo Civil	Orto Sol	Orto Luna 22	Orto Luna 23	Orto Luna 24	Orto Luna 25
°	h m	h m	h m	h m	h m	h m	h m
N 72	////	////	02 50	04 47	04 28	04 05	03 32
N 70	////	01 29	03 15	04 49	04 37	04 23	04 04
68	////	02 12	03 34	04 50	04 43	04 36	04 28
66	////	02 40	03 49	04 51	04 49	04 48	04 47
64	01 18	03 01	04 01	04 52	04 54	04 57	05 02
62	01 56	03 17	04 11	04 53	04 58	05 05	05 14
60	02 22	03 31	04 20	04 54	05 02	05 12	05 25
N 58	02 41	03 43	04 28	04 54	05 06	05 19	05 35
56	02 57	03 53	04 35	04 55	05 09	05 24	05 43
54	03 11	04 01	04 41	04 55	05 11	05 29	05 51
52	03 22	04 09	04 46	04 56	05 14	05 34	05 57
50	03 32	04 16	04 51	04 56	05 16	05 38	06 03
45	03 52	04 31	05 02	04 57	05 21	05 47	06 16
N 40	04 08	04 42	05 11	04 58	05 25	05 54	06 27
35	04 20	04 52	05 18	04 59	05 29	06 01	06 37
30	04 30	05 00	05 25	04 59	05 32	06 07	06 45
20	04 47	05 13	05 36	05 00	05 37	06 17	06 59
N 10	04 59	05 24	05 46	05 01	05 42	06 26	07 12
0	05 09	05 34	05 55	05 02	05 47	06 34	07 24
S 10	05 18	05 42	06 04	05 03	05 52	06 42	07 36
20	05 25	05 51	06 13	05 04	05 57	06 51	07 48
30	05 31	05 59	06 24	05 05	06 03	07 02	08 03
35	05 34	06 04	06 30	05 06	06 06	07 08	08 12
40	05 37	06 09	06 37	05 07	06 10	07 15	08 21
45	05 40	06 15	06 45	05 08	06 14	07 23	08 33
S 50	05 43	06 21	06 54	05 09	06 20	07 33	08 47
52	05 44	06 24	06 59	05 10	06 22	07 37	08 54
54	05 46	06 27	07 04	05 10	06 25	07 42	09 01
56	05 47	06 30	07 09	05 11	06 28	07 48	09 09
58	05 48	06 34	07 15	05 12	06 31	07 54	09 19
S 60	05 49	06 38	07 22	05 12	06 35	08 01	09 29

Lat.	Ocaso Sol	Crepúsculo Civil	Crepúsculo Náutico	Ocaso Luna 22	Ocaso Luna 23	Ocaso Luna 24	Ocaso Luna 25
°	h m	h m	h m	h m	h m	h m	h m
N 72	21 11	////	////	18 14	20 13	22 29	▭
N 70	20 45	22 37	////	18 09	19 58	21 58	24 20
68	20 26	21 50	////	18 04	19 46	21 36	23 35
66	20 10	21 21	////	18 00	19 37	21 18	23 05
64	19 58	20 59	22 47	17 57	19 29	21 04	22 43
62	19 47	20 42	22 05	17 54	19 22	20 52	22 25
60	19 38	20 28	21 38	17 51	19 16	20 42	22 11
N 58	19 30	20 16	21 18	17 49	19 10	20 34	21 59
56	19 23	20 06	21 02	17 47	19 06	20 26	21 48
54	19 17	19 57	20 48	17 46	19 01	20 19	21 38
52	19 11	19 49	20 36	17 44	18 58	20 13	21 30
50	19 06	19 42	20 26	17 43	18 54	20 08	21 23
45	18 55	19 27	20 06	17 40	18 47	19 56	21 07
N 40	18 47	19 15	19 50	17 37	18 41	19 46	20 54
35	18 39	19 05	19 37	17 35	18 35	19 38	20 43
30	18 32	18 57	19 27	17 33	18 31	19 31	20 33
20	18 21	18 44	19 10	17 29	18 23	19 18	20 16
N 10	18 11	18 32	18 58	17 26	18 16	19 07	20 02
0	18 02	18 23	18 47	17 24	18 09	18 57	19 48
S 10	17 53	18 14	18 39	17 21	18 03	18 47	19 35
20	17 43	18 06	18 31	17 18	17 56	18 36	19 21
30	17 32	17 57	18 25	17 14	17 48	18 24	19 04
35	17 26	17 52	18 22	17 12	17 43	18 17	18 55
40	17 19	17 47	18 19	17 10	17 38	18 09	18 44
45	17 11	17 41	18 16	17 08	17 32	18 00	18 32
S 50	17 01	17 35	18 13	17 05	17 25	17 48	18 16
52	16 57	17 32	18 11	17 03	17 22	17 43	18 09
54	16 52	17 29	18 10	17 02	17 18	17 37	18 01
56	16 47	17 25	18 09	17 00	17 14	17 31	17 52
58	16 40	17 22	18 08	16 58	17 10	17 24	17 42
S 60	16 34	17 18	18 06	16 56	17 05	17 16	17 31

Día	SOL E. T. (+) 00h	SOL E. T. (+) 12h	SOL Pas. Mer.	LUNA Pas. Sup.	LUNA Mer. Inf.	LUNA Edad	LUNA Fase
d	m s	m s	h m	h m	h m	d	%
22	01 26	01 32	11 58	11 13	23 35	28	2
23	01 38	01 44	11 58	11 58	24 21	29	0
24	01 49	01 54	11 58	12 46	00 21	01	1

T.U.	ARIES	VENUS −4.5		MARTE −0.9		JUPITER −2.0		SATURNO +0.2	
d h	A.H.G.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.
	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
25 00	213 04.4	212 28.3	N 3 23.6	305 51.4	S23 52.5	142 16.2	N21 50.9	154 21.6	N18 32.8
01	228 06.9	227 30.1	23.3	320 53.4	52.6	157 18.1	51.0	169 23.8	32.9
02	243 09.4	242 32.0	23.0	335 55.4	52.7	172 20.0	51.1	184 25.9	33.0
03	258 11.8	257 33.8	. . 22.7	350 57.3	. . 52.8	187 21.9	. . 51.2	199 28.1	. . 33.0
04	273 14.3	272 35.6	22.4	5 59.3	52.9	202 23.8	51.2	214 30.2	33.1
05	288 16.8	287 37.4	22.1	21 01.3	53.0	217 25.7	51.3	229 32.4	33.2
06	303 19.2	302 39.3	N 3 21.8	36 03.2	S23 53.1	232 27.6	N21 51.4	244 34.5	N18 33.2
07	318 21.7	317 41.1	21.5	51 05.2	53.3	247 29.5	51.5	259 36.7	33.3
08	333 24.1	332 42.9	21.2	66 07.2	53.4	262 31.5	51.5	274 38.8	33.4
09	348 26.6	347 44.7	. . 20.9	81 09.2	. . 53.5	277 33.4	. . 51.6	289 41.0	. . 33.4
10	3 29.1	2 46.5	20.6	96 11.1	53.6	292 35.3	51.7	304 43.1	33.5
11	18 31.5	17 48.3	20.3	111 13.1	53.7	307 37.2	51.7	319 45.3	33.6
12	33 34.0	32 50.1	N 3 20.0	126 15.1	S23 53.8	322 39.1	N21 51.8	334 47.4	N18 33.7
13	48 36.5	47 51.9	19.8	141 17.1	53.9	337 41.0	51.9	349 49.6	33.7
14	63 38.9	62 53.7	19.5	156 19.0	54.0	352 42.9	52.0	4 51.7	33.8
15	78 41.4	77 55.5	. . 19.2	171 21.0	. . 54.2	7 44.8	. . 52.0	19 53.9	. . 33.9
16	93 43.9	92 57.3	18.9	186 23.0	54.3	22 46.7	52.1	34 56.0	33.9
17	108 46.3	107 59.1	18.6	201 25.0	54.4	37 48.6	52.2	49 58.2	34.0
18	123 48.8	123 00.9	N 3 18.4	216 27.0	S23 54.5	52 50.6	N21 52.3	65 00.3	N18 34.1
19	138 51.2	138 02.6	18.1	231 29.0	54.6	67 52.5	52.3	80 02.5	34.1
20	153 53.7	153 04.4	17.8	246 30.9	54.7	82 54.4	52.4	95 04.6	34.2
21	168 56.2	168 06.2	. . 17.5	261 32.9	. . 54.8	97 56.3	. . 52.5	110 06.8	. . 34.3
22	183 58.6	183 08.0	17.3	276 34.9	54.9	112 58.2	52.5	125 09.0	34.3
23	199 01.1	198 09.7	17.0	291 36.9	55.0	128 00.1	52.6	140 11.1	34.4
26 00	214 03.6	213 11.5	N 3 16.7	306 38.9	S23 55.2	143 02.0	N21 52.7	155 13.3	N18 34.5
01	229 06.0	228 13.2	16.5	321 40.9	55.3	158 03.9	52.8	170 15.4	34.5
02	244 08.5	243 15.0	16.2	336 42.9	55.4	173 05.8	52.8	185 17.6	34.6
03	259 11.0	258 16.8	. . 16.0	351 44.9	. . 55.5	188 07.7	. . 52.9	200 19.7	. . 34.7
04	274 13.4	273 18.5	15.7	6 46.9	55.6	203 09.6	53.0	215 21.9	34.7
05	289 15.9	288 20.3	15.4	21 48.9	55.7	218 11.6	53.1	230 24.0	34.8
06	304 18.4	303 22.0	N 3 15.2	36 50.8	S23 55.8	233 13.5	N21 53.1	245 26.2	N18 34.9
07	319 20.8	318 23.7	14.9	51 52.8	55.9	248 15.4	53.2	260 28.3	34.9
08	334 23.3	333 25.5	14.7	66 54.8	56.1	263 17.3	53.3	275 30.5	35.0
09	349 25.7	348 27.2	. . 14.4	81 56.8	. . 56.2	278 19.2	. . 53.4	290 32.6	. . 35.1
10	4 28.2	3 29.0	14.2	96 58.8	56.3	293 21.1	53.4	305 34.8	35.1
11	19 30.7	18 30.7	13.9	112 00.8	56.4	308 23.0	53.5	320 36.9	35.2
12	34 33.1	33 32.4	N 3 13.7	127 02.9	S23 56.5	323 24.9	N21 53.6	335 39.1	N18 35.3
13	49 35.6	48 34.1	13.4	142 04.9	56.6	338 26.8	53.6	350 41.2	35.4
14	64 38.1	63 35.9	13.2	157 06.9	56.7	353 28.7	53.7	5 43.4	35.4
15	79 40.5	78 37.6	. . 13.0	172 08.9	. . 56.8	8 30.6	. . 53.8	20 45.5	. . 35.5
16	94 43.0	93 39.3	12.7	187 10.9	56.9	23 32.5	53.9	35 47.7	35.6
17	109 45.5	108 41.0	12.5	202 12.9	57.1	38 34.4	53.9	50 49.8	35.6
18	124 47.9	123 42.7	N 3 12.3	217 14.9	S23 57.2	53 36.3	N21 54.0	65 52.0	N18 35.7
19	139 50.4	138 44.4	12.0	232 16.9	57.3	68 38.3	54.1	80 54.1	35.8
20	154 52.9	153 46.1	11.8	247 18.9	57.4	83 40.2	54.1	95 56.3	35.8
21	169 55.3	168 47.8	. . 11.6	262 20.9	. . 57.5	98 42.1	. . 54.2	110 58.4	. . 35.9
22	184 57.8	183 49.5	11.3	277 22.9	57.6	113 44.0	54.3	126 00.6	36.0
23	200 00.2	198 51.2	11.1	292 25.0	57.7	128 45.9	54.4	141 02.7	36.0
27 00	215 02.7	213 52.9	N 3 10.9	307 27.0	S23 57.9	143 47.8	N21 54.4	156 04.9	N18 36.1
01	230 05.2	228 54.6	10.7	322 29.0	58.0	158 49.7	54.5	171 07.0	36.2
02	245 07.6	243 56.3	10.5	337 31.0	58.1	173 51.6	54.6	186 09.2	36.2
03	260 10.1	258 57.9	. . 10.2	352 33.0	. . 58.2	188 53.5	. . 54.7	201 11.3	. . 36.3
04	275 12.6	273 59.6	10.0	7 35.1	58.3	203 55.4	54.7	216 13.5	36.4
05	290 15.0	289 01.3	09.8	22 37.1	58.4	218 57.3	54.8	231 15.6	36.4
06	305 17.5	304 03.0	N 3 09.6	37 39.1	S23 58.5	233 59.2	N21 54.9	246 17.8	N18 36.5
07	320 20.0	319 04.6	09.4	52 41.1	58.6	249 01.1	54.9	261 19.9	36.6
08	335 22.4	334 06.3	09.2	67 43.1	58.8	264 03.0	55.0	276 22.1	36.6
09	350 24.9	349 08.0	. . 09.0	82 45.2	. . 58.9	279 04.9	. . 55.1	291 24.2	. . 36.7
10	5 27.4	4 09.6	08.8	97 47.2	59.0	294 06.8	55.2	306 26.4	36.8
11	20 29.8	19 11.3	08.6	112 49.2	59.1	309 08.7	55.2	321 28.5	36.8
12	35 32.3	34 12.9	N 3 08.3	127 51.3	S23 59.2	324 10.6	N21 55.3	336 30.7	N18 36.9
13	50 34.7	49 14.6	08.1	142 53.3	59.3	339 12.6	55.4	351 32.8	37.0
14	65 37.2	64 16.2	08.0	157 55.3	59.4	354 14.5	55.5	6 34.9	37.1
15	80 39.7	79 17.9	. . 07.8	172 57.4	. . 59.5	9 16.4	. . 55.5	21 37.1	. . 37.1
16	95 42.1	94 19.5	07.6	187 59.4	59.7	24 18.3	55.6	36 39.2	37.2
17	110 44.6	109 21.2	07.4	203 01.4	59.8	39 20.2	55.7	51 41.4	37.3
18	125 47.1	124 22.8	N 3 07.2	218 03.5	S23 59.9	54 22.1	N21 55.7	66 43.5	N18 37.3
19	140 49.5	139 24.4	07.0	233 05.5	24 00.0	69 24.0	55.8	81 45.7	37.4
20	155 52.0	154 26.1	06.8	248 07.5	00.1	84 25.9	55.9	96 47.8	37.5
21	170 54.5	169 27.7	. . 06.6	263 09.6	. . 00.2	99 27.8	. . 56.0	111 50.0	. . 37.5
22	185 56.9	184 29.3	06.4	278 11.6	00.3	114 29.7	56.0	126 52.1	37.6
23	200 59.4	199 30.9	06.2	293 13.7	00.5	129 31.6	56.1	141 54.3	37.7
Pas. Mer.	h m 9 42.2	*v* 1.7	*d* 0.2	*v* 2.0	*d* 0.1	*v* 1.9	*d* 0.1	*v* 2.2	*d* 0.1

ESTRELLAS

Nombre	A.H.S.	Dec.
	° ′	° ′
Acamar	315 26.0	S40 18.2
Achernar	335 34.4	S57 13.9
Acrux	173 19.5	S63 06.5
Adhara	255 20.2	S28 58.7
Aldebaran	291 00.7	N16 30.6
Alioth	166 28.4	N55 57.3
Alkaid	153 05.9	N49 18.5
Al Na'ir	27 55.8	S46 57.2
Alnilam	275 56.3	S 1 12.2
Alphard	218 05.4	S 8 39.9
Alphecca	126 18.7	N26 42.6
Alpheratz	357 53.7	N29 05.6
Altair	62 17.5	N 8 52.1
Ankaa	353 25.4	S42 18.0
Antares	112 37.7	S26 26.0
Arcturus	146 04.1	N19 10.6
Atria	107 47.8	S69 01.6
Avior	234 22.0	S59 31.1
Bellatrix	278 42.5	N 6 20.9
Betelgeuse	271 11.9	N 7 24.3
Canopus	264 00.7	S52 42.1
Capella	280 48.9	N46 00.0
Deneb	49 38.0	N45 16.7
Denebola	182 43.1	N14 33.9
Diphda	349 05.7	S17 58.9
Dubhe	194 02.8	N61 44.9
Elnath	278 25.0	N28 36.5
Eltanin	90 50.3	N51 29.1
Enif	33 56.6	N 9 52.6
Fomalhaut	15 34.7	S29 37.0
Gacrux	172 11.2	S57 07.3
Gienah	176 01.9	S17 33.0
Hadar	149 01.0	S60 22.7
Hamal	328 11.9	N23 27.9
Kaus Aust.	83 56.3	S34 23.0
Kochab	137 18.3	N74 09.1
Markab	13 48.1	N15 12.5
Menkar	314 25.4	N 4 05.5
Menkent	148 18.5	S36 22.6
Miaplacidus	221 41.6	S69 43.6
Mirfak	308 54.6	N49 51.8
Nunki	76 10.0	S26 17.7
Peacock	53 34.2	S56 43.7
Pollux	243 39.5	N28 01.5
Procyon	245 09.8	N 5 13.2
Rasalhague	96 15.1	N12 33.4
Regulus	207 53.5	N11 57.7
Rigel	281 21.5	S 8 12.2
Rigil Kent.	140 04.3	S60 50.4
Sabik	102 23.3	S15 43.6
Schedar	349 52.1	N56 32.4
Shaula	96 34.6	S37 06.2
Sirius	258 42.3	S16 43.2
Spica	158 41.0	S11 10.1
Suhail	222 59.4	S43 26.5
Vega	80 45.2	N38 46.8
Zuben'ubi	137 15.7	S16 02.8

	A.H.S.	Pas. Mer.
	° ′	h m
Venus	359 07.9	9 46
Marte	92 35.3	3 33
Júpiter	288 58.4	14 26
Saturno	301 09.7	13 37

T.U.	SOL				LUNA						
	A.H.G.		Dec.		A.H.G.	v	Dec.		d	P.H.	
d h	°	′	°	′	°	′	′	°	′	′	′
25 00	180	29.9	N13	08.3	163	00.7	10.6	N14	34.3	10.4	57.4
01	195	30.1		09.1	177	30.3	10.6		14 44.7	10.4	57.4
02	210	30.2		10.0	191	59.9	10.4		14 55.1	10.4	57.4
03	225	30.3	. .	10.8	206	29.3	10.4		15 05.5	10.2	57.5
04	240	30.4		11.6	220	58.7	10.3		15 15.7	10.2	57.5
05	255	30.5		12.4	235	28.0	10.3		15 25.9	10.1	57.5
06	270	30.6	N13	13.2	249	57.3	10.1	N15	36.0	10.0	57.5
M 07	285	30.7		14.0	264	26.4	10.1		15 46.0	9.9	57.5
I 08	300	30.8		14.8	278	55.5	10.0		15 55.9	9.9	57.6
E 09	315	30.9	. .	15.7	293	24.5	9.9		16 05.8	9.8	57.6
R 10	330	31.0		16.5	307	53.4	9.9		16 15.6	9.7	57.6
C 11	345	31.1		17.3	322	22.3	9.7		16 25.3	9.6	57.6
O 12	0	31.2	N13	18.1	336	51.0	9.7	N16	34.9	9.6	57.6
L 13	15	31.3		18.9	351	19.7	9.7		16 44.5	9.4	57.7
E 14	30	31.4		19.7	5	48.4	9.5		16 53.9	9.4	57.7
S 15	45	31.5	. .	20.5	20	16.9	9.4		17 03.3	9.3	57.7
16	60	31.6		21.3	34	45.3	9.4		17 12.6	9.2	57.7
17	75	31.8		22.1	49	13.7	9.3		17 21.8	9.1	57.7
18	90	31.9	N13	23.0	63	42.0	9.3	N17	30.9	9.0	57.8
19	105	32.0		23.8	78	10.3	9.1		17 39.9	8.9	57.8
20	120	32.1		24.6	92	38.4	9.1		17 48.8	8.8	57.8
21	135	32.2	. .	25.4	107	06.5	9.0		17 57.6	8.7	57.8
22	150	32.3		26.2	121	34.5	8.9		18 06.3	8.7	57.8
23	165	32.4		27.0	136	02.4	8.8		18 15.0	8.5	57.9
26 00	180	32.5	N13	27.8	150	30.2	8.8	N18	23.5	8.4	57.9
01	195	32.6		28.6	164	58.0	8.7		18 31.9	8.4	57.9
02	210	32.7		29.4	179	25.7	8.6		18 40.3	8.2	57.9
03	225	32.8	. .	30.2	193	53.3	8.5		18 48.5	8.1	57.9
04	240	32.9		31.0	208	20.8	8.4		18 56.6	8.1	58.0
05	255	33.0		31.8	222	48.2	8.4		19 04.7	7.9	58.0
06	270	33.1	N13	32.6	237	15.6	8.3	N19	12.6	7.8	58.0
07	285	33.2		33.5	251	42.9	8.2		19 20.4	7.7	58.0
J 08	300	33.3		34.3	266	10.1	8.2		19 28.1	7.6	58.0
U 09	315	33.4	. .	35.1	280	37.3	8.1		19 35.7	7.5	58.0
10	330	33.5		35.9	295	04.4	8.0		19 43.2	7.3	58.1
E 11	345	33.6		36.7	309	31.4	7.9		19 50.5	7.3	58.1
V 12	0	33.7	N13	37.5	323	58.3	7.8	N19	57.8	7.1	58.1
13	15	33.8		38.3	338	25.1	7.8		20 04.9	7.1	58.1
E 14	30	33.9		39.1	352	51.9	7.7		20 12.0	6.9	58.1
15	45	34.0	. .	39.9	7	18.6	7.7		20 18.9	6.8	58.2
S 16	60	34.1		40.7	21	45.3	7.5		20 25.7	6.7	58.2
17	75	34.2		41.5	36	11.8	7.5		20 32.4	6.5	58.2
18	90	34.3	N13	42.3	50	38.3	7.4	N20	38.9	6.5	58.2
19	105	34.4		43.1	65	04.7	7.4		20 45.4	6.3	58.2
20	120	34.5		43.9	79	31.1	7.3		20 51.7	6.2	58.2
21	135	34.6	. .	44.7	93	57.4	7.2		20 57.9	6.0	58.3
22	150	34.7		45.5	108	23.6	7.2		21 03.9	6.0	58.3
23	165	34.8		46.3	122	49.8	7.1		21 09.9	5.8	58.3
27 00	180	34.9	N13	47.1	137	15.9	7.0	N21	15.7	5.7	58.3
01	195	35.0		47.9	151	41.9	6.9		21 21.4	5.5	58.3
02	210	35.1		48.7	166	07.8	6.9		21 26.9	5.5	58.3
03	225	35.2	. .	49.5	180	33.7	6.9		21 32.4	5.3	58.4
04	240	35.3		50.3	194	59.6	6.8		21 37.7	5.1	58.4
05	255	35.4		51.1	209	25.4	6.7		21 42.8	5.1	58.4
06	270	35.5	N13	51.9	223	51.1	6.6	N21	47.9	4.9	58.4
07	285	35.6		52.6	238	16.7	6.6		21 52.8	4.8	58.4
08	300	35.7		53.4	252	42.3	6.6		21 57.6	4.6	58.4
V 09	315	35.8	. .	54.2	267	07.9	6.4		22 02.2	4.5	58.4
I 10	330	35.9		55.0	281	33.3	6.5		22 06.7	4.4	58.5
E 11	345	35.9		55.8	295	58.8	6.3		22 11.1	4.2	58.5
R 12	0	36.0	N13	56.6	310	24.1	6.4	N22	15.3	4.1	58.5
N 13	15	36.1		57.4	324	49.5	6.2		22 19.4	3.9	58.5
E 14	30	36.2		58.2	339	14.7	6.3		22 23.3	3.8	58.5
S 15	45	36.3	. .	59.0	353	40.0	6.1		22 27.1	3.7	58.5
16	60	36.4	13	59.8	8	05.1	6.1		22 30.8	3.5	58.5
17	75	36.5	14	00.6	22	30.2	6.1		22 34.3	3.4	58.6
18	90	36.6	N14	01.4	36	55.3	6.0	N22	37.7	3.3	58.6
19	105	36.7		02.2	51	20.3	6.0		22 41.0	3.1	58.6
20	120	36.8		02.9	65	45.3	6.0		22 44.1	2.9	58.6
21	135	36.9	. .	03.7	80	10.3	5.9		22 47.0	2.8	58.6
22	150	37.0		04.5	94	35.2	5.8		22 49.8	2.7	58.6
23	165	37.1		05.3	109	00.0	5.9	N22	52.5	2.5	58.6
	SD	15.9	d	0.8	SD		15.7		15.8		15.9

Lat.	Crepúsculo Náutico	Crepúsculo Civil	Orto Sol	Orto Luna 25	Orto Luna 26	Orto Luna 27	Orto Luna 28
°	h m	h m	h m	h m	h m	h m	h m
N 72	////	////	02 30	03 32	▭	▭	▭
N 70	////	00 52	02 59	04 04	03 30	▭	▭
68	////	01 51	03 20	04 28	04 17	03 52	▭
66	////	02 24	03 37	04 47	04 47	04 52	05 11
64	00 45	02 48	03 51	05 02	05 10	05 26	05 59
62	01 38	03 06	04 02	05 14	05 28	05 51	06 30
60	02 08	03 21	04 12	05 25	05 44	06 11	06 53
N 58	02 30	03 34	04 20	05 35	05 57	06 28	07 12
56	02 47	03 45	04 28	05 43	06 08	06 42	07 28
54	03 02	03 54	04 34	05 51	06 18	06 54	07 42
52	03 14	04 02	04 40	05 57	06 27	07 04	07 53
50	03 25	04 10	04 46	06 03	06 35	07 14	08 04
45	03 46	04 25	04 57	06 16	06 52	07 34	08 26
N 40	04 03	04 38	05 07	06 27	07 06	07 51	08 44
35	04 16	04 48	05 15	06 37	07 17	08 05	08 59
30	04 27	04 57	05 22	06 45	07 28	08 17	09 11
20	04 44	05 11	05 34	06 59	07 46	08 37	09 34
N 10	04 58	05 23	05 45	07 12	08 02	08 56	09 53
0	05 08	05 33	05 54	07 24	08 17	09 13	10 11
S 10	05 18	05 42	06 04	07 36	08 31	09 30	10 29
20	05 26	05 52	06 14	07 48	08 47	09 48	10 48
30	05 33	06 01	06 26	08 03	09 06	10 09	11 11
35	05 37	06 06	06 32	08 12	09 17	10 22	11 24
40	05 40	06 12	06 40	08 21	09 29	10 36	11 39
45	05 44	06 18	06 49	08 33	09 44	10 53	11 57
S 50	05 47	06 25	06 59	08 47	10 02	11 14	12 20
52	05 49	06 29	07 04	08 54	10 11	11 24	12 30
54	05 50	06 32	07 09	09 01	10 20	11 36	12 43
56	05 52	06 36	07 15	09 09	10 31	11 49	12 56
58	05 54	06 40	07 22	09 19	10 43	12 04	13 13
S 60	05 55	06 45	07 29	09 29	10 58	12 22	13 32

Lat.	Ocaso Sol	Crepúsculo Civil	Crepúsculo Náutico	Ocaso Luna 25	Ocaso Luna 26	Ocaso Luna 27	Ocaso Luna 28
°	h m	h m	h m	h m	h m	h m	h m
N 72	21 31	////	////	▭	▭	▭	▭
N 70	21 01	23 23	////	24 20	00 20	▭	▭
68	20 38	22 11	////	23 35	25 54	01 54	▭
66	20 21	21 36	////	23 05	24 56	00 56	02 38
64	20 07	21 11	23 27	22 43	24 22	00 22	01 49
62	19 55	20 52	22 23	22 25	23 57	25 19	01 19
60	19 45	20 36	21 51	22 11	23 38	24 55	00 55
N 58	19 37	20 24	21 29	21 59	23 22	24 37	00 37
56	19 29	20 12	21 10	21 48	23 08	24 21	00 21
54	19 22	20 03	20 56	21 38	22 56	24 08	00 08
52	19 16	19 54	20 43	21 30	22 46	23 56	24 57
50	19 11	19 47	20 32	21 23	22 36	23 46	24 46
45	18 59	19 31	20 10	21 07	22 17	23 24	24 24
N 40	18 50	19 19	19 54	20 54	22 01	23 06	24 07
35	18 41	19 08	19 40	20 43	21 48	22 52	23 52
30	18 34	18 59	19 29	20 33	21 36	22 39	23 39
20	18 22	18 45	19 12	20 16	21 16	22 17	23 17
N 10	18 11	18 33	18 58	20 02	20 59	21 58	22 57
0	18 01	18 22	18 47	19 48	20 43	21 40	22 39
S 10	17 51	18 13	18 38	19 35	20 27	21 23	22 21
20	17 41	18 04	18 30	19 21	20 10	21 04	22 02
30	17 29	17 54	18 22	19 04	19 50	20 42	21 39
35	17 23	17 49	18 18	18 55	19 39	20 29	21 26
40	17 15	17 43	18 15	18 44	19 25	20 14	21 11
45	17 06	17 37	18 11	18 32	19 10	19 57	20 53
S 50	16 56	17 29	18 07	18 16	18 51	19 35	20 31
52	16 51	17 26	18 06	18 09	18 42	19 25	20 20
54	16 46	17 23	18 04	18 01	18 32	19 13	20 08
56	16 40	17 19	18 03	17 52	18 21	19 00	19 54
58	16 33	17 15	18 01	17 42	18 08	18 45	19 37
S 60	16 25	17 10	17 59	17 31	17 53	18 26	19 18

Día	SOL E.T. (+) 00h	SOL E.T. (+) 12h	SOL Pas. Mer.	LUNA Pas. Sup.	LUNA Mer. Inf.	LUNA Edad	LUNA Fase
d	m s	m s	h m	h m	h m	d	%
25	02 00	02 05	11 58	13 36	01 10	02	4
26	02 10	02 15	11 58	14 30	02 02	03	9
27	02 19	02 24	11 58	15 26	02 58	04	17

T.U.	ARIES	VENUS −4.5		MARTE −1.0		JUPITER −2.0		SATURNO +0.2	
d h	A.H.G.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.
	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
28 00	216 01.8	214 32.6	N 3 06.1	308 15.7	S24 00.6	144 33.5	N21 56.2	156 56.4	N18 37.7
01	231 04.3	229 34.2	05.9	323 17.8	00.7	159 35.4	56.2	171 58.6	37.8
02	246 06.8	244 35.8	05.7	338 19.8	00.8	174 37.3	56.3	187 00.7	37.9
03	261 09.2	259 37.4	. . 05.5	353 21.9	. . 00.9	189 39.2	. . 56.4	202 02.9	. . 37.9
04	276 11.7	274 39.0	05.4	8 23.9	01.0	204 41.1	56.5	217 05.0	38.0
05	291 14.2	289 40.6	05.2	23 25.9	01.1	219 43.0	56.5	232 07.2	38.1
06	306 16.6	304 42.2	N 3 05.0	38 28.0	S24 01.3	234 44.9	N21 56.6	247 09.3	N18 38.1
07	321 19.1	319 43.8	04.8	53 30.1	01.4	249 46.8	56.7	262 11.5	38.2
S 08	336 21.6	334 45.4	04.7	68 32.1	01.5	264 48.7	56.7	277 13.6	38.3
A 09	351 24.0	349 47.0	. . 04.5	83 34.2	. . 01.6	279 50.6	. 56.8	292 15.8	. . 38.3
10	6 26.5	4 48.6	04.3	98 36.2	01.7	294 52.5	56.9	307 17.9	38.4
B 11	21 29.0	19 50.2	04.2	113 38.3	01.8	309 54.4	57.0	322 20.1	38.5
12	36 31.4	34 51.8	N 3 04.0	128 40.3	S24 01.9	324 56.3	N21 57.0	337 22.2	N18 38.5
A 13	51 33.9	49 53.3	03.9	143 42.4	02.1	339 58.2	57.1	352 24.4	38.6
D 14	66 36.3	64 54.9	03.7	158 44.4	02.2	355 00.1	57.2	7 26.5	38.7
15	81 38.8	79 56.5	. . 03.5	173 46.5	. . 02.3	10 02.0	. . 57.2	22 28.6	. . 38.7
O 16	96 41.3	94 58.1	03.4	188 48.6	02.4	25 03.9	57.3	37 30.8	38.8
17	111 43.7	109 59.6	03.2	203 50.6	02.5	40 05.8	57.4	52 32.9	38.9
18	126 46.2	125 01.2	N 3 03.1	218 52.7	S24 02.6	55 07.7	N21 57.5	67 35.1	N18 39.0
19	141 48.7	140 02.8	02.9	233 54.8	02.8	70 09.6	57.5	82 37.2	39.0
20	156 51.1	155 04.3	02.8	248 56.8	02.9	85 11.5	57.6	97 39.4	39.1
21	171 53.6	170 05.9	. . 02.6	263 58.9	. . 03.0	100 13.4	. . 57.7	112 41.5	. . 39.2
22	186 56.1	185 07.5	02.5	279 01.0	03.1	115 15.3	57.7	127 43.7	39.2
23	201 58.5	200 09.0	02.4	294 03.0	03.2	130 17.2	57.8	142 45.8	39.3
29 00	217 01.0	215 10.6	N 3 02.2	309 05.1	S24 03.3	145 19.1	N21 57.9	157 48.0	N18 39.4
01	232 03.5	230 12.1	02.1	324 07.2	03.4	160 21.0	58.0	172 50.1	39.4
02	247 05.9	245 13.6	01.9	339 09.3	03.6	175 22.9	58.0	187 52.3	39.5
03	262 08.4	260 15.2	. . 01.8	354 11.3	. . 03.7	190 24.8	. . 58.1	202 54.4	. . 39.6
04	277 10.8	275 16.7	01.7	9 13.4	03.8	205 26.7	58.2	217 56.6	39.6
05	292 13.3	290 18.3	01.5	24 15.5	03.9	220 28.6	58.2	232 58.7	39.7
06	307 15.8	305 19.8	N 3 01.4	39 17.6	S24 04.0	235 30.5	N21 58.3	248 00.9	N18 39.8
07	322 18.2	320 21.3	01.3	54 19.6	04.1	250 32.4	58.4	263 03.0	39.8
D 08	337 20.7	335 22.9	01.2	69 21.7	04.3	265 34.3	58.5	278 05.1	39.9
O 09	352 23.2	350 24.4	. . 01.0	84 23.8	. . 04.4	280 36.2	. . 58.5	293 07.3	. . 40.0
M 10	7 25.6	5 25.9	00.9	99 25.9	04.5	295 38.1	58.6	308 09.4	40.0
I 11	22 28.1	20 27.4	00.8	114 28.0	04.6	310 40.0	58.7	323 11.6	40.1
12	37 30.6	35 28.9	N 3 00.7	129 30.1	S24 04.7	325 41.9	N21 58.7	338 13.7	N18 40.2
N 13	52 33.0	50 30.5	00.6	144 32.2	04.8	340 43.8	58.8	353 15.9	40.2
G 14	67 35.5	65 32.0	00.4	159 34.2	04.9	355 45.7	58.9	8 18.0	40.3
O 15	82 38.0	80 33.5	. . 00.3	174 36.3	. . 05.1	10 47.6	. . 59.0	23 20.2	. . 40.4
16	97 40.4	95 35.0	00.2	189 38.4	05.2	25 49.5	59.0	38 22.3	40.4
17	112 42.9	110 36.5	00.1	204 40.5	05.3	40 51.4	59.1	53 24.5	40.5
18	127 45.3	125 38.0	N 3 00.0	219 42.6	S24 05.4	55 53.3	N21 59.2	68 26.6	N18 40.6
19	142 47.8	140 39.5	2 59.9	234 44.7	05.5	70 55.2	59.2	83 28.8	40.6
20	157 50.3	155 41.0	59.8	249 46.8	05.6	85 57.1	59.3	98 30.9	40.7
21	172 52.7	170 42.5	. . 59.7	264 48.9	. . 05.8	100 59.0	. . 59.4	113 33.0	. . 40.8
22	187 55.2	185 44.0	59.6	279 51.0	05.9	116 00.9	59.5	128 35.2	40.8
23	202 57.7	200 45.5	59.5	294 53.1	06.0	131 02.8	59.5	143 37.3	40.9
30 00	218 00.1	215 46.9	N 2 59.4	309 55.2	S24 06.1	146 04.7	N21 59.6	158 39.5	N18 41.0
01	233 02.6	230 48.4	59.3	324 57.3	06.2	161 06.6	59.7	173 41.6	41.1
02	248 05.1	245 49.9	59.2	339 59.4	06.3	176 08.5	59.7	188 43.8	41.1
03	263 07.5	260 51.4	. . 59.1	355 01.5	. . 06.5	191 10.4	. . 59.8	203 45.9	. . 41.2
04	278 10.0	275 52.9	59.0	10 03.6	06.6	206 12.3	21 59.9	218 48.1	41.3
05	293 12.5	290 54.3	58.9	25 05.7	06.7	221 14.2	22 00.0	233 50.2	41.3
06	308 14.9	305 55.8	N 2 58.8	40 07.8	S24 06.8	236 16.1	N22 00.0	248 52.4	N18 41.4
07	323 17.4	320 57.3	58.7	55 09.9	06.9	251 18.0	00.1	263 54.5	41.5
08	338 19.8	335 58.7	58.6	70 12.0	07.0	266 19.9	00.2	278 56.6	41.5
L 09	353 22.3	351 00.2	. . 58.5	85 14.1	. . 07.2	281 21.8	. . 00.2	293 58.8	. . 41.6
U 10	8 24.8	6 01.6	58.5	100 16.3	07.3	296 23.7	00.3	309 00.9	41.7
11	23 27.2	21 03.1	58.4	115 18.4	07.4	311 25.6	00.4	324 03.1	41.7
N 12	38 29.7	36 04.5	N 2 58.3	130 20.5	S24 07.5	326 27.5	N22 00.4	339 05.2	N18 41.8
E 13	53 32.2	51 06.0	58.2	145 22.6	07.6	341 29.4	00.5	354 07.4	41.9
14	68 34.6	66 07.4	58.1	160 24.7	07.8	356 31.3	00.6	9 09.5	41.9
S 15	83 37.1	81 08.9	. . 58.1	175 26.8	. . 07.9	11 33.2	. . 00.7	24 11.7	. . 42.0
16	98 39.6	96 10.3	58.0	190 29.0	08.0	26 35.1	00.7	39 13.8	42.1
17	113 42.0	111 11.8	57.9	205 31.1	08.1	41 37.0	00.8	54 15.9	42.1
18	128 44.5	126 13.2	N 2 57.8	220 33.2	S24 08.2	56 38.9	N22 00.9	69 18.1	N18 42.2
19	143 46.9	141 14.6	57.8	235 35.3	08.3	71 40 8	00.9	84 20.2	42.3
20	158 49.4	156 16.1	57.7	250 37.4	08.5	86 42.7	01.0	99 22.4	42.3
21	173 51.9	171 17.5	. . 57.6	265 39.6	. . 08.6	101 44.6	. . 01.1	114 24.5	. . 42.4
22	188 54.3	186 18.9	57.6	280 41.7	08.7	116 46.4	01.2	129 26.7	42.5
23	203 56.8	201 20.4	57.5	295 43.8	08.8	131 48.3	01.2	144 28.8	42.5
Pas. Mer.	h m 9 30.4	v 1.5	d 0.1	v 2.1	d 0.1	v 1.9	d 0.1	v 2.1	d 0.1

ESTRELLAS

Nombre	A.H.S.	Dec.
	° ′	° ′
Acamar	315 26.0	S40 18.2
Achernar	335 34.4	S57 13.9
Acrux	173 19.5	S63 06.5
Adhara	255 20.2	S28 58.7
Aldebaran	291 00.7	N16 30.6
Alioth	166 28.4	N55 57.3
Alkaid	153 05.9	N49 18.5
Al Na'ir	27 55.8	S46 57.2
Alnilam	275 56.3	S 1 12.2
Alphard	218 05.4	S 8 39.9
Alphecca	126 18.7	N26 42.6
Alpheratz	357 53.7	N29 05.6
Altair	62 17.5	N 8 52.1
Ankaa	353 25.4	S42 18.0
Antares	112 37.7	S26 26.1
Arcturus	146 04.1	N19 10.6
Atria	107 47.7	S69 01.6
Avior	234 22.0	S59 31.1
Bellatrix	278 42.5	N 6 20.9
Betelgeuse	271 11.9	N 7 24.3
Canopus	264 00.7	S52 42.1
Capella	280 48.9	N46 00.0
Deneb	49 38.0	N45 16.7
Denebola	182 43.1	N14 34.0
Diphda	349 05.7	S17 58.9
Dubhe	194 02.9	N61 44.9
Elnath	278 25.0	N28 36.5
Eltanin	90 50.2	N51 29.1
Enif	33 56.6	N 9 52.6
Fomalhaut	15 34.7	S29 37.0
Gacrux	172 11.2	S57 07.3
Gienah	176 01.9	S17 33.0
Hadar	149 00.9	S60 22.7
Hamal	328 11.9	N23 27.9
Kaus Aust.	83 56.2	S34 23.0
Kochab	137 18.3	N74 09.1
Markab	13 48.0	N15 12.5
Menkar	314 25.4	N 4 05.5
Menkent	148 18.5	S36 22.6
Miaplacidus	221 41.7	S69 43.6
Mirfak	308 54.6	N49 51.8
Nunki	76 10.0	S26 17.7
Peacock	53 34.1	S56 43.7
Pollux	243 39.5	N28 01.5
Procyon	245 09.8	N 5 13.2
Rasalhague	96 15.1	N12 33.4
Regulus	207 53.5	N11 57.7
Rigel	281 21.5	S 8 12.2
Rigil Kent.	140 04.3	S60 50.4
Sabik	102 23.2	S15 43.6
Schedar	349 52.0	N56 32.4
Shaula	96 34.6	S37 06.2
Sirius	258 42.3	S16 43.2
Spica	158 41.0	S11 10.1
Suhail	222 59.5	S43 26.5
Vega	80 45.2	N38 46.8
Zuben'ubi	137 15.7	S16 02.8

	A.H.S.	Pas. Mer.
	° ′	h m
Venus	358 09.6	9 38
Marte	92 04.1	3 23
Júpiter	288 18.2	14 17
Saturno	300 47.0	13 27

T.U.	SOL				LUNA					
	A.H.G.		Dec.		A.H.G.	v	Dec.	d	P.H.	
d h	°	′	°	′	°	′	′	°	′	′	′
28 00	180	37.2	N14	06.1	123	24.9	5.8	N22	55.0	2.4	58.7
01	195	37.3		06.9	137	49.7	5.7		22 57.4	2.2	58.7
02	210	37.4		07.7	152	14.4	5.7		22 59.6	2.1	58.7
03	225	37.4	. .	08.5	166	39.1	5.7		23 01.7	1.9	58.7
04	240	37.5		09.3	181	03.8	5.7		23 03.6	1.8	58.7
05	255	37.6		10.0	195	28.5	5.6		23 05.4	1.6	58.7
06	270	37.7	N14	10.8	209	53.1	5.6	N23	07.0	1.5	58.7
07	285	37.8		11.6	224	17.7	5.6		23 08.5	1.3	58.7
S 08	300	37.9		12.4	238	42.3	5.5		23 09.8	1.2	58.8
A 09	315	38.0	. .	13.2	253	06.8	5.5		23 11.0	1.0	58.8
10	330	38.1		14.0	267	31.3	5.5		23 12.0	0.9	58.8
B 11	345	38.2		14.8	281	55.8	5.5		23 12.9	0.7	58.8
A 12	0	38.3	N14	15.5	296	20.3	5.5	N23	13.6	0.6	58.8
13	15	38.4		16.3	310	44.8	5.4		23 14.2	0.4	58.8
D 14	30	38.4		17.1	325	09.2	5.4		23 14.6	0.3	58.8
15	45	38.5	. .	17.9	339	33.6	5.4		23 14.9	0.1	58.8
O 16	60	38.6		18.7	353	58.0	5.4		23 15.0	0.1	58.9
17	75	38.7		19.4	8	22.4	5.4		23 14.9	0.2	58.9
18	90	38.8	N14	20.2	22	46.8	5.4	N23	14.7	0.3	58.9
19	105	38.9		21.0	37	11.2	5.4		23 14.4	0.5	58.9
20	120	39.0		21.8	51	35.6	5.3		23 13.9	0.6	58.9
21	135	39.1	. .	22.6	65	59.9	5.4		23 13.3	0.8	58.9
22	150	39.2		23.3	80	24.3	5.3		23 12.5	1.0	58.9
23	165	39.2		24.1	94	48.6	5.4		23 11.5	1.1	58.9
29 00	180	39.3	N14	24.9	109	13.0	5.3	N23	10.4	1.3	58.9
01	195	39.4		25.7	123	37.3	5.4		23 09.1	1.4	59.0
02	210	39.5		26.5	138	01.7	5.3		23 07.7	1.6	59.0
03	225	39.6	. .	27.2	152	26.0	5.4		23 06.1	1.7	59.0
04	240	39.7		28.0	166	50.4	5.4		23 04.4	1.8	59.0
05	255	39.8		28.8	181	14.8	5.4		23 02.6	2.1	59.0
06	270	39.9	N14	29.6	195	39.2	5.3	N23	00.5	2.2	59.0
07	285	39.9		30.3	210	03.5	5.4		22 58.3	2.3	59.0
D 08	300	40.0		31.1	224	27.9	5.4		22 56.0	2.5	59.0
O 09	315	40.1	. .	31.9	238	52.3	5.5		22 53.5	2.6	59.0
M 10	330	40.2		32.7	253	16.8	5.4		22 50.9	2.8	59.0
I 11	345	40.3		33.4	267	41.2	5.4		22 48.1	2.9	59.0
12	0	40.4	N14	34.2	282	05.6	5.5	N22	45.2	3.1	59.1
N 13	15	40.4		35.0	296	30.1	5.5		22 42.1	3.2	59.1
G 14	30	40.5		35.8	310	54.6	5.5		22 38.9	3.4	59.1
O 15	45	40.6	. .	36.5	325	19.1	5.5		22 35.5	3.6	59.1
16	60	40.7		37.3	339	43.6	5.6		22 31.9	3.6	59.1
17	75	40.8		38.1	354	08.2	5.6		22 28.3	3.9	59.1
18	90	40.9	N14	38.9	8	32.8	5.6	N22	24.4	3.9	59.1
19	105	41.0		39.6	22	57.4	5.6		22 20.5	4.2	59.1
20	120	41.0		40.4	37	22.0	5.7		22 16.3	4.2	59.1
21	135	41.1	. .	41.2	51	46.7	5.7		22 12.1	4.5	59.1
22	150	41.2		41.9	66	11.4	5.7		22 07.6	4.5	59.1
23	165	41.3		42.7	80	36.1	5.7		22 03.1	4.7	59.1
30 00	180	41.4	N14	43.5	95	00.8	5.8	N21	58.4	4.9	59.2
01	195	41.4		44.2	109	25.6	5.9		21 53.5	5.0	59.2
02	210	41.5		45.0	123	50.5	5.8		21 48.5	5.1	59.2
03	225	41.6	. .	45.8	138	15.3	5.9		21 43.4	5.3	59.2
04	240	41.7		46.5	152	40.2	6.0		21 38.1	5.5	59.2
05	255	41.8		47.3	167	05.2	5.9		21 32.6	5.5	59.2
06	270	41.9	N14	48.1	181	30.1	6.1	N21	27.1	5.7	59.2
07	285	41.9		48.8	195	55.2	6.0		21 21.4	5.9	59.2
08	300	42.0		49.6	210	20.2	6.1		21 15.5	6.0	59.2
L 09	315	42.1	. .	50.4	224	45.3	6.2		21 09.5	6.1	59.2
U 10	330	42.2		51.1	239	10.5	6.1		21 03.4	6.2	59.2
N 11	345	42.3		51.9	253	35.6	6.3		20 57.2	6.4	59.2
12	0	42.3	N14	52.7	268	00.9	6.3	N20	50.8	6.6	59.2
E 13	15	42.4		53.4	282	26.2	6.3		20 44.2	6.6	59.2
14	30	42.5		54.2	296	51.5	6.4		20 37.6	6.8	59.2
S 15	45	42.6	. .	54.9	311	16.9	6.4		20 30.8	7.0	59.3
16	60	42.7		55.7	325	42.3	6.5		20 23.8	7.0	59.3
17	75	42.7		56.5	340	07.8	6.5		20 16.8	7.2	59.3
18	90	42.8	N14	57.2	354	33.3	6.5	N20	09.6	7.3	59.3
19	105	42.9		58.0	8	58.8	6.7		20 02.3	7.5	59.3
20	120	43.0		58.7	23	24.5	6.7		19 54.8	7.6	59.3
21	135	43.0	14	59.5	37	50.2	6.7		19 47.2	7.7	59.3
22	150	43.1	15	00.3	52	15.9	6.8		19 39.5	7.8	59.3
23	165	43.2	N15	01.0	66	41.7	6.8	N19	31.7	8.0	59.3
	SD	15.9	d	0.8	SD		16.0		16.1		16.1

Lat.	Crepúsculo Náutico	Crepúsculo Civil	Orto Sol	Orto Luna 28	Orto Luna 29	Orto Luna 30	Orto Luna 1
°	h m	h m	h m	h m	h m	h m	h m
N 72	////	////	02 08	▭	▭	▭	▭
N 70	////	////	02 42	▭	▭	▭	08 42
68	////	01 27	03 07	▭	▭	07 01	09 25
66	////	02 07	03 25	05 11	06 13	07 58	09 53
64	////	02 34	03 40	05 59	07 01	08 32	10 14
62	01 16	02 55	03 53	06 30	07 32	08 56	10 32
60	01 53	03 11	04 03	06 53	07 55	09 15	10 46
N 58	02 18	03 25	04 13	07 12	08 14	09 31	10 58
56	02 37	03 37	04 21	07 28	08 30	09 45	11 08
54	02 53	03 47	04 28	07 42	08 43	09 56	11 18
52	03 06	03 56	04 34	07 53	08 55	10 07	11 26
50	03 18	04 04	04 40	08 04	09 05	10 16	11 33
45	03 41	04 20	04 52	08 26	09 27	10 35	11 49
N 40	03 58	04 34	05 03	08 44	09 44	10 51	12 02
35	04 12	04 44	05 11	08 59	09 59	11 04	12 12
30	04 24	04 54	05 19	09 11	10 12	11 16	12 22
20	04 42	05 09	05 32	09 34	10 34	11 36	12 38
N 10	04 56	05 22	05 43	09 53	10 53	11 53	12 52
0	05 08	05 33	05 54	10 11	11 10	12 09	13 06
S 10	05 18	05 43	06 04	10 29	11 28	12 25	13 19
20	05 26	05 53	06 15	10 48	11 47	12 42	13 33
30	05 35	06 03	06 28	11 11	12 09	13 02	13 49
35	05 39	06 09	06 35	11 24	12 22	13 13	13 58
40	05 43	06 15	06 43	11 39	12 36	13 26	14 09
45	05 47	06 22	06 52	11 57	12 54	13 41	14 21
S 50	05 51	06 30	07 04	12 20	13 15	14 00	14 36
52	05 53	06 33	07 09	12 30	13 26	14 09	14 43
54	05 55	06 37	07 15	12 43	13 37	14 19	14 51
56	05 57	06 41	07 21	12 56	13 50	14 30	15 00
58	05 59	06 46	07 28	13 13	14 06	14 43	15 09
S 60	06 02	06 51	07 36	13 32	14 24	14 58	15 20

Lat.	Ocaso Sol	Crepúsculo Civil	Crepúsculo Náutico	Ocaso Luna 28	Ocaso Luna 29	Ocaso Luna 30	Ocaso Luna 1
°	h m	h m	h m	h m	h m	h m	h m
N 72	21 53	////	////	▭	▭	▭	▭
N 70	21 17	////	////	▭	▭	▭	05 15
68	20 51	22 36	////	▭	▭	04 55	04 32
66	20 32	21 52	////	02 38	03 39	03 58	04 02
64	20 17	21 24	////	01 49	02 51	03 24	03 40
62	20 04	21 03	22 46	01 19	02 20	02 59	03 22
60	19 53	20 46	22 06	00 55	01 57	02 39	03 07
N 58	19 44	20 31	21 40	00 37	01 38	02 23	02 54
56	19 35	20 20	21 20	00 21	01 22	02 09	02 43
54	19 28	20 09	21 04	00 08	01 09	01 57	02 34
52	19 22	20 00	20 50	24 57	00 57	01 46	02 25
50	19 16	19 52	20 38	24 46	00 46	01 37	02 17
45	19 03	19 35	20 15	24 24	00 24	01 17	02 00
N 40	18 53	19 22	19 57	24 07	00 07	01 00	01 46
35	18 44	19 11	19 43	23 52	24 46	00 46	01 35
30	18 36	19 01	19 31	23 39	24 34	00 34	01 24
20	18 23	18 46	19 13	23 17	24 14	00 14	01 07
N 10	18 11	18 33	18 59	22 57	23 55	24 51	00 51
0	18 01	18 22	18 47	22 39	23 38	24 36	00 36
S 10	17 50	18 12	18 37	22 21	23 21	24 21	00 21
20	17 39	18 02	18 28	22 02	23 03	24 06	00 06
30	17 27	17 51	18 20	21 39	22 42	23 47	24 53
35	17 19	17 46	18 15	21 26	22 30	23 37	24 45
40	17 11	17 39	18 11	21 11	22 15	23 24	24 35
45	17 02	17 32	18 07	20 53	21 58	23 10	24 24
S 50	16 50	17 24	18 03	20 31	21 37	22 52	24 11
52	16 45	17 21	18 01	20 20	21 27	22 43	24 04
54	16 39	17 17	17 59	20 08	21 16	22 34	23 57
56	16 33	17 13	17 57	19 54	21 03	22 23	23 49
58	16 26	17 08	17 54	19 37	20 48	22 11	23 40
S 60	16 17	17 03	17 52	19 18	20 29	21 56	23 30

Día	SOL E.T. (+) 00h	SOL E.T. (+) 12h	SOL Pas. Mer.	LUNA Pas. Mer. Sup.	LUNA Pas. Mer. Inf.	Edad	Fase
d	m s	m s	h m	h m	h m	d	%
28	02 28	02 33	11 57	16 25	03 56	05	26
29	02 37	02 41	11 57	17 24	04 55	06	36
30	02 45	02 49	11 57	18 23	05 54	07	48

T.U.	ARIES	VENUS −4.5		MARTE −1.1		JUPITER −2.0		SATURNO +0.1	
	A.H.G.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
1 00	218 59.3	216 21.8	N 2 57.5	310 45.9	S24 08.9	146 50.2	N22 01.3	159 31.0	N18 42.6
01	234 01.7	231 23.2	57.4	325 48.1	09.0	161 52.1	01.4	174 33.1	42.7
02	249 04.2	246 24.6	57.3	340 50.2	09.2	176 54.0	01.4	189 35.2	42.7
03	264 06.7	261 26.0	. . 57.3	355 52.3	. . 09.3	191 55.9	. . 01.5	204 37.4	. . 42.8
04	279 09.1	276 27.4	57.2	10 54.5	09.4	206 57.8	01.6	219 39.5	42.9
05	294 11.6	291 28.8	57.2	25 56.6	09.5	221 59.7	01.6	234 41.7	42.9
06	309 14.1	306 30.2	N 2 57.1	40 58.7	S24 09.6	237 01.6	N22 01.7	249 43.8	N18 43.0
07	324 16.5	321 31.6	57.1	56 00.9	09.8	252 03.5	01.8	264 46.0	43.1
M 08	339 19.0	336 33.0	57.0	71 03.0	09.9	267 05.4	01.9	279 48.1	43.1
09	354 21.4	351 34.4	. . 57.0	86 05.2	. . 10.0	282 07.3	. . 01.9	294 50.3	. . 43.2
A 10	9 23.9	6 35.8	56.9	101 07.3	10.1	297 09.2	02.0	309 52.4	43.3
R 11	24 26.4	21 37.2	56.9	116 09.4	10.2	312 11.1	02.1	324 54.5	43.4
T 12	39 28.8	36 38.6	N 2 56.9	131 11.6	S24 10.4	327 13.0	N22 02.1	339 56.7	N18 43.4
13	54 31.3	51 40.0	56.8	146 13.7	10.5	342 14.9	02.2	354 58.8	43.5
E 14	69 33.8	66 41.4	56.8	161 15.9	10.6	357 16.8	02.3	10 01.0	43.6
15	84 36.2	81 42.8	. . 56.7	176 18.0	. . 10.7	12 18.7	. . 02.3	25 03.1	. . 43.6
S 16	99 38.7	96 44.2	56.7	191 20.2	10.8	27 20.6	02.4	40 05.3	43.7
17	114 41.2	111 45.5	56.7	206 22.3	10.9	42 22.4	02.5	55 07.4	43.8
18	129 43.6	126 46.9	N 2 56.6	221 24.5	S24 11.1	57 24.3	N22 02.6	70 09.5	N18 43.8
19	144 46.1	141 48.3	56.6	236 26.6	11.2	72 26.2	02.6	85 11.7	43.9
20	159 48.6	156 49.7	56.6	251 28.8	11.3	87 28.1	02.7	100 13.8	44.0
21	174 51.0	171 51.0	. . 56.6	266 30.9	. . 11.4	102 30.0	. . 02.8	115 16.0	. . 44.0
22	189 53.5	186 52.4	56.5	281 33.1	11.5	117 31.9	02.8	130 18.1	44.1
23	204 55.9	201 53.8	56.5	296 35.2	11.7	132 33.8	02.9	145 20.3	44.2
2 00	219 58.4	216 55.1	N 2 56.5	311 37.4	S24 11.8	147 35.7	N22 03.0	160 22.4	N18 44.2
01	235 00.9	231 56.5	56.5	326 39.6	11.9	162 37.6	03.0	175 24.5	44.3
02	250 03.3	246 57.8	56.4	341 41.7	12.0	177 39.5	03.1	190 26.7	44.4
03	265 05.8	261 59.2	. . 56.4	356 43.9	. . 12.1	192 41.4	. . 03.2	205 28.8	. . 44.4
04	280 08.3	277 00.5	56.4	11 46.0	12.3	207 43.3	03.3	220 31.0	44.5
05	295 10.7	292 01.9	56.4	26 48.2	12.4	222 45.2	03.3	235 33.1	44.6
06	310 13.2	307 03.2	N 2 56.4	41 50.4	S24 12.5	237 47.1	N22 03.4	250 35.3	N18 44.6
M 07	325 15.7	322 04.6	56.4	56 52.5	12.6	252 48.9	03.5	265 37.4	44.7
I 08	340 18.1	337 05.9	56.4	71 54.7	12.7	267 50.8	03.5	280 39.5	44.8
E 09	355 20.6	352 07.2	. . 56.4	86 56.9	. . 12.9	282 52.7	. . 03.6	295 41.7	. . 44.8
R 10	10 23.0	7 08.6	56.3	101 59.1	13.0	297 54.6	03.7	310 43.8	44.9
C 11	25 25.5	22 09.9	56.3	117 01.2	13.1	312 56.5	03.7	325 46.0	45.0
O 12	40 28.0	37 11.2	N 2 56.3	132 03.4	S24 13.2	327 58.4	N22 03.8	340 48.1	N18 45.0
L 13	55 30.4	52 12.6	56.3	147 05.6	13.3	343 00.3	03.9	355 50.3	45.1
E 14	70 32.9	67 13.9	56.3	162 07.7	13.5	358 02.2	03.9	10 52.4	45.2
S 15	85 35.4	82 15.2	. . 56.3	177 09.9	. . 13.6	13 04.1	. . 04.0	25 54.5	. . 45.2
16	100 37.8	97 16.5	56.3	192 12.1	13.7	28 06.0	04.1	40 56.7	45.3
17	115 40.3	112 17.8	56.3	207 14.3	13.8	43 07.9	04.2	55 58.8	45.4
18	130 42.8	127 19.2	N 2 56.4	222 16.5	S24 14.0	58 09.7	N22 04.2	71 01.0	N18 45.4
19	145 45.2	142 20.5	56.4	237 18.6	14.1	73 11.6	04.3	86 03.1	45.5
20	160 47.7	157 21.8	56.4	252 20.8	14.2	88 13.5	04.4	101 05.3	45.6
21	175 50.2	172 23.1	. . 56.4	267 23.0	. . 14.3	103 15.4	. . 04.4	116 07.4	. . 45.6
22	190 52.6	187 24.4	56.4	282 25.2	14.4	118 17.3	04.5	131 09.5	45.7
23	205 55.1	202 25.7	56.4	297 27.4	14.6	133 19.2	04.6	146 11.7	45.8
3 00	220 57.5	217 27.0	N 2 56.4	312 29.6	S24 14.7	148 21.1	N22 04.6	161 13.8	N18 45.8
01	236 00.0	232 28.3	56.4	327 31.8	14.8	163 23.0	04.7	176 16.0	45.9
02	251 02.5	247 29.6	56.5	342 33.9	14.9	178 24.9	04.8	191 18.1	46.0
03	266 04.9	262 30.9	. . 56.5	357 36.1	. . 15.0	193 26.8	. . 04.8	206 20.2	. . 46.0
04	281 07.4	277 32.2	56.5	12 38.3	15.2	208 28.7	04.9	221 22.4	46.1
05	296 09.9	292 33.5	56.5	27 40.5	15.3	223 30.5	05.0	236 24.5	46.2
06	311 12.3	307 34.8	N 2 56.5	42 42.7	S24 15.4	238 32.4	N22 05.1	251 26.7	N18 46.2
07	326 14.8	322 36.0	56.6	57 44.9	15.5	253 34.3	05.1	266 28.8	46.3
J 08	341 17.3	337 37.3	56.6	72 47.1	15.7	268 36.2	05.2	281 31.0	46.4
U 09	356 19.7	352 38.6	. . 56.6	87 49.3	. . 15.8	283 38.1	. . 05.3	296 33.1	. . 46.5
E 10	11 22.2	7 39.9	56.7	102 51.5	15.9	298 40.0	05.3	311 35.2	46.5
V 11	26 24.7	22 41.2	56.7	117 53.7	16.0	313 41.9	05.4	326 37.4	46.6
12	41 27.1	37 42.4	N 2 56.7	132 55.9	S24 16.1	328 43.8	N22 05.5	341 39.5	N18 46.7
E 13	56 29.6	52 43.7	56.8	147 58.1	16.3	343 45.7	05.5	356 41.7	46.7
14	71 32.0	67 45.0	56.8	163 00.3	16.4	358 47.5	05.6	11 43.8	46.8
S 15	86 34.5	82 46.2	. . 56.8	178 02.5	. . 16.5	13 49.4	. . 05.7	26 45.9	. . 46.9
16	101 37.0	97 47.5	56.9	193 04.7	16.6	28 51.3	05.7	41 48.1	46.9
17	116 39.4	112 48.8	56.9	208 06.9	16.8	43 53.2	05.8	56 50.2	47.0
18	131 41.9	127 50.0	N 2 57.0	223 09.2	S24 16.9	58 55.1	N22 05.9	71 52.4	N18 47.1
19	146 44.4	142 51.3	57.0	238 11.4	17.0	73 57.0	05.9	86 54.5	47.1
20	161 46.8	157 52.5	57.0	253 13.6	17.1	88 58.9	06.0	101 56.7	47.2
21	176 49.3	172 53.8	. . 57.1	268 15.8	. . 17.2	104 00.8	. . 06.1	116 58.8	. . 47.3
22	191 51.8	187 55.0	57.1	283 18.0	17.4	119 02.7	06.2	132 00.9	47.3
23	206 54.2	202 56.3	57.2	298 20.2	17.5	134 04.5	06.2	147 03.1	47.4
	h m								
Pas. Mer.	9 18.6	*v* 1.3	*d* 0.0	*v* 2.2	*d* 0.1	*v* 1.9	*d* 0.1	*v* 2.1	*d* 0.1

ESTRELLAS		
Nombre	A.H.S.	Dec.
	° ′	° ′
Acamar	315 26.0	S40 18.1
Achernar	335 34.3	S57 13.9
Acrux	173 19.5	S63 06.5
Adhara	255 20.2	S28 58.7
Aldebaran	291 00.7	N16 30.6
Alioth	166 28.5	N55 57.4
Alkaid	153 05.9	N49 18.5
Al Na'ir	27 55.8	S46 57.2
Alnilam	275 56.3	S 1 12.2
Alphard	218 05.4	S 8 39.9
Alphecca	126 18.7	N26 42.6
Alpheratz	357 53.7	N29 05.6
Altair	62 17.4	N 8 52.1
Ankaa	353 25.4	S42 18.0
Antares	112 37.7	S26 26.1
Arcturus	146 04.1	N19 10.6
Atria	107 47.7	S69 01.6
Avior	234 22.1	S59 31.1
Bellatrix	278 42.5	N 6 20.9
Betelgeuse	271 11.9	N 7 24.3
Canopus	264 00.7	S52 42.1
Capella	280 49.0	N46 00.0
Deneb	49 38.0	N45 16.7
Denebola	182 43.1	N14 34.0
Diphda	349 05.7	S17 58.9
Dubhe	194 02.9	N61 44.9
Elnath	278 25.0	N28 36.5
Eltanin	90 50.2	N51 29.1
Enif	33 56.6	N 9 52.6
Fomalhaut	15 34.6	S29 37.0
Gacrux	172 11.2	S57 07.3
Gienah	176 01.9	S17 33.0
Hadar	149 00.9	S60 22.8
Hamal	328 11.9	N23 27.9
Kaus Aust.	83 56.2	S34 23.0
Kochab	137 18.3	N74 09.1
Markab	13 48.0	N15 12.5
Menkar	314 25.4	N 4 05.5
Menkent	148 18.5	S36 22.6
Miaplacidus	221 41.7	S69 43.6
Mirfak	308 54.6	N49 51.8
Nunki	76 09.9	S26 17.7
Peacock	53 34.1	S56 43.7
Pollux	243 39.5	N28 01.5
Procyon	245 09.8	N 5 13.3
Rasalhague	96 15.0	N12 33.4
Regulus	207 53.5	N11 57.7
Rigel	281 21.5	S 8 12.2
Rigil Kent.	140 04.3	S60 50.4
Sabik	102 23.2	S15 43.6
Schedar	349 52.0	N56 32.4
Shaula	96 34.6	S37 06.2
Sirius	258 42.3	S16 43.2
Spica	158 41.0	S11 10.1
Suhail	222 59.5	S43 26.5
Vega	80 45.2	N38 46.9
Zuben'ubi	137 15.7	S16 02.8

	A.H.S.	Pas. Mer.
	° ′	h m
Venus	356 56.7	9 31
Marte	91 39.0	3 13
Júpiter	287 37.3	14 08
Saturno	300 24.0	13 17

T.U.	SOL				LUNA						
	A.H.G.		Dec.		A.H.G.	v		Dec.		d	P.H.
d h	°	′	°	′	°	′	′	°	′	′	′
1 00	180	43.3	N15	01.8	81	07.5	6.9	N19	23.7	8.0	59.3
01	195	43.4		02.5	95	33.4	6.9	19	15.7	8.2	59.3
02	210	43.4		03.3	109	59.3	7.0	19	07.5	8.4	59.3
03	225	43.5	. .	04.1	124	25.3	7.1	18	59.1	8.4	59.3
04	240	43.6		04.8	138	51.4	7.1	18	50.7	8.6	59.3
05	255	43.7		05.6	153	17.5	7.2	18	42.1	8.6	59.3
06	270	43.7	N15	06.3	167	43.7	7.2	N18	33.5	8.8	59.3
07	285	43.8		07.1	182	09.9	7.3	18	24.7	8.9	59.3
M 08	300	43.9		07.8	196	36.2	7.4	18	15.8	9.1	59.3
A 09	315	44.0	. .	08.6	211	02.6	7.4	18	06.7	9.1	59.3
R 10	330	44.0		09.3	225	29.0	7.4	17	57.6	9.3	59.3
11	345	44.1		10.1	239	55.4	7.5	17	48.3	9.3	59.3
T 12	0	44.2	N15	10.8	254	21.9	7.6	N17	39.0	9.5	59.3
13	15	44.3		11.6	268	48.5	7.6	17	29.5	9.6	59.3
E 14	30	44.3		12.4	283	15.1	7.7	17	19.9	9.6	59.3
15	45	44.4	. .	13.1	297	41.8	7.8	17	10.3	9.8	59.3
S 16	60	44.5		13.9	312	08.6	7.8	17	00.5	9.9	59.3
17	75	44.5		14.6	326	35.4	7.9	16	50.6	10.0	59.3
18	90	44.6	N15	15.4	341	02.3	7.9	N16	40.6	10.1	59.3
19	105	44.7		16.1	355	29.2	8.0	16	30.5	10.2	59.4
20	120	44.8		16.9	9	56.2	8.1	16	20.3	10.3	59.4
21	135	44.8	. .	17.6	24	23.3	8.1	16	10.0	10.4	59.4
22	150	44.9		18.4	38	50.4	8.1	15	59.6	10.5	59.4
23	165	45.0		19.1	53	17.5	8.3	15	49.1	10.6	59.4
2 00	180	45.1	N15	19.9	67	44.8	8.3	N15	38.5	10.7	59.4
01	195	45.1		20.6	82	12.1	8.3	15	27.8	10.8	59.4
02	210	45.2		21.3	96	39.4	8.4	15	17.0	10.9	59.4
03	225	45.3	. .	22.1	111	06.8	8.5	15	06.1	10.9	59.4
04	240	45.3		22.8	125	34.3	8.5	14	55.2	11.1	59.4
05	255	45.4		23.6	140	01.8	8.6	14	44.1	11.1	59.4
06	270	45.5	N15	24.3	154	29.4	8.6	N14	33.0	11.2	59.4
M 07	285	45.5		25.1	168	57.0	8.7	14	21.8	11.3	59.4
I 08	300	45.6		25.8	183	24.7	8.7	14	10.5	11.4	59.4
E 09	315	45.7	. .	26.6	197	52.4	8.9	13	59.1	11.5	59.4
R 10	330	45.8		27.3	212	20.3	8.8	13	47.6	11.6	59.4
C 11	345	45.8		28.0	226	48.1	8.9	13	36.0	11.6	59.4
O 12	0	45.9	N15	28.8	241	16.0	9.0	N13	24.4	11.7	59.4
L 13	15	46.0		29.5	255	44.0	9.1	13	12.7	11.8	59.3
E 14	30	46.0		30.3	270	12.1	9.0	13	00.9	11.9	59.3
S 15	45	46.1	. .	31.0	284	40.1	9.2	12	49.0	11.9	59.3
16	60	46.2		31.8	299	08.3	9.2	12	37.1	12.0	59.3
17	75	46.2		32.5	313	36.5	9.2	12	25.1	12.1	59.3
18	90	46.3	N15	33.2	328	04.7	9.3	N12	13.0	12.2	59.3
19	105	46.4		34.0	342	33.0	9.4	12	00.8	12.2	59.3
20	120	46.4		34.7	357	01.4	9.4	11	48.6	12.3	59.3
21	135	46.5	. .	35.4	11	29.8	9.4	11	36.3	12.4	59.3
22	150	46.6		36.2	25	58.2	9.6	11	23.9	12.4	59.3
23	165	46.6		36.9	40	26.8	9.5	11	11.5	12.5	59.3
3 00	180	46.7	N15	37.7	54	55.3	9.6	N10	59.0	12.5	59.3
01	195	46.8		38.4	69	23.9	9.7	10	46.5	12.6	59.3
02	210	46.8		39.1	83	52.6	9.7	10	33.9	12.7	59.3
03	225	46.9	. .	39.9	98	21.3	9.7	10	21.2	12.7	59.3
04	240	47.0		40.6	112	50.0	9.9	10	08.5	12.8	59.3
05	255	47.0		41.3	127	18.9	9.8	9	55.7	12.8	59.3
06	270	47.1	N15	42.1	141	47.7	9.9	N 9	42.9	12.9	59.3
07	285	47.2		42.8	156	16.6	9.9	9	30.0	13.0	59.3
J 08	300	47.2		43.5	170	45.5	10.0	9	17.0	13.0	59.3
U 09	315	47.3	. .	44.3	185	14.5	10.1	9	04.0	13.0	59.3
10	330	47.3		45.0	199	43.6	10.0	8	51.0	13.1	59.3
E 11	345	47.4		45.7	214	12.6	10.2	8	37.9	13.1	59.3
V 12	0	47.5	N15	46.5	228	41.8	10.1	N 8	24.8	13.2	59.3
13	15	47.5		47.2	243	10.9	10.2	8	11.6	13.2	59.3
E 14	30	47.6		47.9	257	40.1	10.3	7	58.4	13.3	59.3
15	45	47.7	. .	48.7	272	09.4	10.2	7	45.1	13.3	59.2
S 16	60	47.7		49.4	286	38.6	10.4	7	31.8	13.4	59.2
17	75	47.8		50.1	301	08.0	10.3	7	18.4	13.4	59.2
18	90	47.9	N15	50.8	315	37.3	10.4	N 7	05.0	13.4	59.2
19	105	47.9		51.6	330	06.7	10.5	6	51.6	13.5	59.2
20	120	48.0		52.3	344	36.2	10.4	6	38.1	13.4	59.2
21	135	48.0	. .	53.0	359	05.6	10.5	6	24.7	13.6	59.2
22	150	48.1		53.8	13	35.1	10.6	6	11.1	13.5	59.2
23	165	48.2		54.5	28	04.7	10.6	N 5	57.6	13.6	59.2
	SD	15.9	d	0.7	SD		16.2		16.2		16.1

Lat.	Crepúsculo Náutico	Crepúsculo Civil	Orto Sol	Orto Luna 1	Orto Luna 2	Orto Luna 3	Orto Luna 4
°	h m	h m	h m	h m	h m	h m	h m
N 72	////	////	01 44	▭	10 42	13 05	15 15
N 70	////	////	02 25	08 42	11 09	13 17	15 18
68	////	00 55	02 53	09 25	11 30	13 28	15 20
66	////	01 49	03 13	09 53	11 46	13 36	15 22
64	////	02 20	03 30	10 14	12 00	13 43	15 24
62	00 48	02 43	03 44	10 32	12 11	13 49	15 25
60	01 37	03 02	03 55	10 46	12 20	13 54	15 27
N 58	02 06	03 16	04 05	10 58	12 28	13 59	15 28
56	02 27	03 29	04 14	11 08	12 35	14 03	15 29
54	02 44	03 40	04 22	11 18	12 42	14 06	15 30
52	02 59	03 49	04 28	11 26	12 48	14 10	15 31
50	03 11	03 58	04 35	11 33	12 53	14 13	15 32
45	03 35	04 15	04 48	11 49	13 04	14 19	15 33
N 40	03 54	04 30	04 59	12 02	13 13	14 24	15 35
35	04 08	04 41	05 08	12 12	13 21	14 29	15 36
30	04 21	04 51	05 16	12 22	13 28	14 33	15 37
20	04 40	05 07	05 30	12 38	13 40	14 40	15 39
N 10	04 55	05 20	05 42	12 52	13 50	14 46	15 40
0	05 07	05 32	05 54	13 06	14 00	14 52	15 42
S 10	05 18	05 43	06 05	13 19	14 09	14 57	15 43
20	05 27	05 54	06 16	13 33	14 20	15 03	15 45
30	05 36	06 05	06 30	13 49	14 31	15 10	15 47
35	05 41	06 11	06 37	13 58	14 38	15 14	15 48
40	05 45	06 18	06 46	14 09	14 46	15 19	15 49
45	05 50	06 25	06 56	14 21	14 55	15 24	15 51
S 50	05 55	06 34	07 08	14 36	15 05	15 30	15 53
52	05 58	06 38	07 14	14 43	15 10	15 33	15 53
54	06 00	06 42	07 20	14 51	15 16	15 36	15 54
56	06 02	06 47	07 27	15 00	15 22	15 40	15 55
58	06 05	06 52	07 35	15 09	15 28	15 43	15 56
S 60	06 08	06 57	07 43	15 20	15 36	15 48	15 57

Lat.	Ocaso Sol	Crepúsculo Civil	Crepúsculo Náutico	Ocaso Luna 1	Ocaso Luna 2	Ocaso Luna 3	Ocaso Luna 4
°	h m	h m	h m	h m	h m	h m	h m
N 72	22 18	////	////	▭	05 12	04 39	04 16
N 70	21 34	////	////	05 15	04 43	04 24	04 09
68	21 05	23 13	////	04 32	04 20	04 12	04 04
66	20 43	22 10	////	04 02	04 03	04 02	04 00
64	20 26	21 37	////	03 40	03 48	03 53	03 56
62	20 12	21 13	23 18	03 22	03 36	03 46	03 53
60	20 00	20 55	22 22	03 07	03 26	03 39	03 50
N 58	19 50	20 39	21 52	02 54	03 17	03 34	03 48
56	19 41	20 27	21 29	02 43	03 09	03 29	03 45
54	19 34	20 15	21 12	02 34	03 02	03 24	03 43
52	19 27	20 06	20 57	02 25	02 55	03 20	03 41
50	19 20	19 57	20 45	02 17	02 49	03 16	03 40
45	19 07	19 39	20 20	02 00	02 37	03 08	03 36
N 40	18 56	19 25	20 01	01 46	02 26	03 01	03 33
35	18 46	19 13	19 46	01 35	02 17	02 55	03 30
30	18 38	19 03	19 34	01 24	02 09	02 50	03 27
20	18 24	18 47	19 14	01 07	01 55	02 41	03 23
N 10	18 12	18 34	18 59	00 51	01 43	02 32	03 19
0	18 00	18 22	18 47	00 36	01 32	02 25	03 16
S 10	17 49	18 11	18 36	00 21	01 20	02 17	03 12
20	17 37	18 00	18 26	00 06	01 08	02 09	03 08
30	17 24	17 49	18 17	24 53	00 53	01 59	03 04
35	17 16	17 43	18 13	24 45	00 45	01 53	03 01
40	17 08	17 36	18 08	24 35	00 35	01 47	02 58
45	16 57	17 28	18 03	24 24	00 24	01 40	02 54
S 50	16 45	17 19	17 58	24 11	00 11	01 31	02 50
52	16 40	17 15	17 56	24 04	00 04	01 26	02 48
54	16 33	17 11	17 53	23 57	25 22	01 22	02 46
56	16 26	17 06	17 51	23 49	25 17	01 17	02 44
58	16 19	17 01	17 48	23 40	25 11	01 11	02 41
S 60	16 10	16 56	17 45	23 30	25 04	01 04	02 38

Día	SOL E. T. (+) 00h	SOL E. T. (+) 12h	SOL Pas. Mer.	LUNA Pas. Mer. Sup.	LUNA Mer. Inf.	LUNA Edad	LUNA Fase
d	m s	m s	h m	h m	h m	d	%
1	02 53	02 57	11 57	19 19	06 51	08	59
2	03 00	03 03	11 57	20 12	07 46	09	70
3	03 07	03 10	11 57	21 04	08 38	10	80

T.U.	ARIES	VENUS −4.5		MARTE −1.2		JUPITER −2.0		SATURNO +0.1	
d h	A.H.G.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.
	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
4 00	221 56.7	217 57.5	N 2 57.2	313 22.4	S24 17.6	149 06.4	N22 06.3	162 05.2	N18 47.5
01	236 59.1	232 58.7	57.3	328 24.7	17.7	164 08.3	06.4	177 07.4	47.5
02	252 01.6	248 00.0	57.4	343 26.9	17.9	179 10.2	06.4	192 09.5	47.6
03	267 04.1	263 01.2	. . 57.4	358 29.1	. . 18.0	194 12.1	. . 06.5	207 11.6	. . 47.7
04	282 06.5	278 02.5	57.5	13 31.3	18.1	209 14.0	06.6	222 13.8	47.7
05	297 09.0	293 03.7	57.5	28 33.5	18.2	224 15.9	06.6	237 15.9	47.8
06	312 11.5	308 04.9	N 2 57.6	43 35.8	S24 18.4	239 17.8	N22 06.7	252 18.1	N18 47.9
07	327 13.9	323 06.1	57.7	58 38.0	18.5	254 19.6	06.8	267 20.2	47.9
V 08	342 16.4	338 07.4	57.7	73 40.2	18.6	269 21.5	06.8	282 22.3	48.0
I 09	357 18.9	353 08.6	. . 57.8	88 42.5	. . 18.7	284 23.4	. . 06.9	297 24.5	. . 48.1
E 10	12 21.3	8 09.8	57.8	103 44.7	18.8	299 25.3	07.0	312 26.6	48.1
R 11	27 23.8	23 11.0	57.9	118 46.9	19.0	314 27.2	07.0	327 28.8	48.2
N 12	42 26.3	38 12.3	N 2 58.0	133 49.2	S24 19.1	329 29.1	N22 07.1	342 30.9	N18 48.3
E 13	57 28.7	53 13.5	58.1	148 51.4	19.2	344 31.0	07.2	357 33.0	48.3
S 14	72 31.2	68 14.7	58.1	163 53.6	19.3	359 32.9	07.2	12 35.2	48.4
15	87 33.6	83 15.9	. . 58.2	178 55.9	. . 19.5	14 34.7	. . 07.3	27 37.3	. . 48.5
16	102 36.1	98 17.1	58.3	193 58.1	19.6	29 36.6	07.4	42 39.5	48.5
17	117 38.6	113 18.3	58.4	209 00.3	19.7	44 38.5	07.4	57 41.6	48.6
18	132 41.0	128 19.5	N 2 58.4	224 02.6	S24 19.8	59 40.4	N22 07.5	72 43.7	N18 48.7
19	147 43.5	143 20.7	58.5	239 04.8	20.0	74 42.3	07.6	87 45.9	48.7
20	162 46.0	158 21.9	58.6	254 07.1	20.1	89 44.2	07.7	102 48.0	48.8
21	177 48.4	173 23.1	. . 58.7	269 09.3	. . 20.2	104 46.1	. . 07.7	117 50.2	. . 48.9
22	192 50.9	188 24.3	58.8	284 11.5	20.3	119 47.9	07.8	132 52.3	48.9
23	207 53.4	203 25.5	58.9	299 13.8	20.5	134 49.8	07.9	147 54.4	49.0
5 00	222 55.8	218 26.7	N 2 58.9	314 16.0	S24 20.6	149 51.7	N22 07.9	162 56.6	N18 49.1
01	237 58.3	233 27.9	59.0	329 18.3	20.7	164 53.6	08.0	177 58.7	49.1
02	253 00.7	248 29.0	59.1	344 20.5	20.8	179 55.5	08.1	193 00.9	49.2
03	268 03.2	263 30.2	. . 59.2	359 22.8	. . 21.0	194 57.4	. . 08.1	208 03.0	. . 49.3
04	283 05.7	278 31.4	59.3	14 25.0	21.1	209 59.3	08.2	223 05.1	49.3
05	298 08.1	293 32.6	59.4	29 27.3	21.2	225 01.1	08.3	238 07.3	49.4
06	313 10.6	308 33.8	N 2 59.5	44 29.6	S24 21.3	240 03.0	N22 08.3	253 09.4	N18 49.5
S 07	328 13.1	323 34.9	59.6	59 31.8	21.5	255 04.9	08.4	268 11.6	49.5
08	343 15.5	338 36.1	59.7	74 34.1	21.6	270 06.8	08.5	283 13.7	49.6
A 09	358 18.0	353 37.3	. . 59.8	89 36.3	. . 21.7	285 08.7	. . 08.5	298 15.8	. . 49.7
10	13 20.5	8 38.4	2 59.9	104 38.6	21.8	300 10.6	08.6	313 18.0	49.7
B 11	28 22.9	23 39.6	3 00.0	119 40.9	22.0	315 12.5	08.7	328 20.1	49.8
A 12	43 25.4	38 40.8	N 3 00.1	134 43.1	S24 22.1	330 14.3	N22 08.7	343 22.3	N18 49.9
13	58 27.9	53 41.9	00.2	149 45.4	22.2	345 16.2	08.8	358 24.4	49.9
D 14	73 30.3	68 43.1	00.3	164 47.7	22.3	0 18.1	08.9	13 26.5	50.0
15	88 32.8	83 44.2	. . 00.4	179 49.9	. . 22.5	15 20.0	. . 08.9	28 28.7	. . 50.1
O 16	103 35.2	98 45.4	00.5	194 52.2	22.6	30 21.9	09.0	43 30.8	50.1
17	118 37.7	113 46.6	00.7	209 54.5	22.7	45 23.8	09.1	58 32.9	50.2
18	133 40.2	128 47.7	N 3 00.8	224 56.7	S24 22.8	60 25.6	N22 09.1	73 35.1	N18 50.3
19	148 42.6	143 48.8	00.9	239 59.0	23.0	75 27.5	09.2	88 37.2	50.3
20	163 45.1	158 50.0	01.0	255 01.3	23.1	90 29.4	09.3	103 39.4	50.4
21	178 47.6	173 51.1	. . 01.1	270 03.6	. . 23.2	105 31.3	. . 09.3	118 41.5	. . 50.5
22	193 50.0	188 52.3	01.2	285 05.8	23.4	120 33.2	09.4	133 43.6	50.5
23	208 52.5	203 53.4	01.4	300 08.1	23.5	135 35.1	09.5	148 45.8	50.6
6 00	223 55.0	218 54.6	N 3 01.5	315 10.4	S24 23.6	150 36.9	N22 09.5	163 47.9	N18 50.7
01	238 57.4	233 55.7	01.6	330 12.7	23.7	165 38.8	09.6	178 50.1	50.7
02	253 59.9	248 56.8	01.7	345 14.9	23.9	180 40.7	09.7	193 52.2	50.8
03	269 02.4	263 57.9	. . 01.9	0 17.2	. . 24.0	195 42.6	. . 09.7	208 54.3	. . 50.9
04	284 04.8	278 59.1	02.0	15 19.5	24.1	210 44.5	09.8	223 56.5	50.9
05	299 07.3	294 00.2	02.1	30 21.8	24.2	225 46.4	09.9	238 58.6	51.0
06	314 09.7	309 01.3	N 3 02.2	45 24.1	S24 24.4	240 48.2	N22 09.9	254 00.7	N18 51.1
07	329 12.2	324 02.4	02.4	60 26.4	24.5	255 50.1	10.0	269 02.9	51.1
D 08	344 14.7	339 03.6	02.5	75 28.7	24.6	270 52.0	10.1	284 05.0	51.2
O 09	359 17.1	354 04.7	. . 02.6	90 31.0	. . 24.7	285 53.9	. . 10.1	299 07.2	. . 51.3
M 10	14 19.6	9 05.8	02.8	105 33.3	24.9	300 55.8	10.2	314 09.3	51.3
I 11	29 22.1	24 06.9	02.9	120 35.5	25.0	315 57.7	10.3	329 11.4	51.4
N 12	44 24.5	39 08.0	N 3 03.1	135 37.8	S24 25.1	330 59.5	N22 10.3	344 13.6	N18 51.5
G 13	59 27.0	54 09.1	03.2	150 40.1	25.3	346 01.4	10.4	359 15.7	51.5
O 14	74 29.5	69 10.2	03.3	165 42.4	25.4	1 03.3	10.5	14 17.9	51.6
15	89 31.9	84 11.3	. . 03.5	180 44.7	. . 25.5	16 05.2	. . 10.5	29 20.0	. . 51.7
16	104 34.4	99 12.4	03.6	195 47.0	25.6	31 07.1	10.6	44 22.1	51.7
17	119 36.8	114 13.5	03.8	210 49.3	25.8	46 08.9	10.7	59 24.3	51.8
18	134 39.3	129 14.6	N 3 03.9	225 51.6	S24 25.9	61 10.8	N22 10.7	74 26.4	N18 51.9
19	149 41.8	144 15.7	04.1	240 53.9	26.0	76 12.7	10.8	89 28.5	51.9
20	164 44.2	159 16.8	04.2	255 56.2	26.2	91 14.6	10.9	104 30.7	52.0
21	179 46.7	174 17.9	. . 04.4	270 58.6	. . 26.3	106 16.5	. . 10.9	119 32.8	. . 52.1
22	194 49.2	189 19.0	04.5	286 00.9	26.4	121 18.4	11.0	134 35.0	52.1
23	209 51.6	204 20.1	04.7	301 03.2	26.5	136 20.2	11.1	149 37.1	52.2
	h m								
Pas. Mer.	9 06.8	v 1.2	d 0.1	v 2.3	d 0.1	v 1.9	d 0.1	v 2.1	d 0.1

ESTRELLAS

Nombre	A.H.S. ° ′	Dec. ° ′
Acamar	315 26.0	S40 18.1
Achernar	335 34.3	S57 13.9
Acrux	173 19.6	S63 06.5
Adhara	255 20.2	S28 58.6
Aldebaran	291 00.7	N16 30.6
Alioth	166 28.5	N55 57.4
Alkaid	153 05.9	N49 18.5
Al Na'ir	27 55.7	S46 57.2
Alnilam	275 56.3	S 1 12.2
Alphard	218 05.4	S 8 39.9
Alphecca	126 18.7	N26 42.6
Alpheratz	357 53.7	N29 05.6
Altair	62 17.4	N 8 52.1
Ankaa	353 25.4	S42 18.0
Antares	112 37.6	S26 26.1
Arcturus	146 04.1	N19 10.6
Atria	107 47.6	S69 01.6
Avior	234 22.1	S59 31.1
Bellatrix	278 42.5	N 6 20.9
Betelgeuse	271 11.9	N 7 24.3
Canopus	264 00.7	S52 42.1
Capella	280 49.0	N46 00.0
Deneb	49 38.0	N45 16.8
Denebola	182 43.1	N14 34.0
Diphda	349 05.7	S17 58.9
Dubhe	194 02.9	N61 44.9
Elnath	278 25.0	N28 36.5
Eltanin	90 50.2	N51 29.1
Enif	33 56.5	N 9 52.6
Fomalhaut	15 34.6	S29 37.0
Gacrux	172 11.2	S57 07.3
Gienah	176 01.9	S17 33.0
Hadar	149 00.9	S60 22.8
Hamal	328 11.9	N23 27.9
Kaus Aust.	83 56.2	S34 23.0
Kochab	137 18.3	N74 09.1
Markab	13 48.0	N15 12.5
Menkar	314 25.4	N 4 05.5
Menkent	148 18.5	S36 22.6
Miaplacidus	221 41.8	S69 43.6
Mirfak	308 54.6	N49 51.8
Nunki	76 09.9	S26 17.7
Peacock	53 34.0	S56 43.7
Pollux	243 39.5	N28 01.5
Procyon	245 09.8	N 5 13.3
Rasalhague	96 15.0	N12 33.4
Regulus	207 53.6	N11 57.7
Rigel	281 21.5	S 8 12.2
Rigil Kent.	140 04.3	S60 50.4
Sabik	102 23.2	S15 43.6
Schedar	349 52.0	N56 32.3
Shaula	96 34.5	S37 06.2
Sirius	258 42.4	S16 43.2
Spica	158 41.0	S11 10.1
Suhail	222 59.5	S43 26.5
Vega	80 45.2	N38 46.9
Zuben'ub	137 15.7	S16 02.8

	A.H.S. ° ′	Pas. Mer. h m
Venus	355 30.9	9 25
Marte	91 20.2	3 02
Júpiter	286 55.9	13 59
Saturno	300 00.8	13 06

T.U.	SOL A.H.G.	SOL Dec.	LUNA A.H.G.	v	LUNA Dec.	d	LUNA P.H.
d h	° ′	° ′	° ′	′	° ′	′	′
4 00	180 48.2	N15 55.2	42 34.3	10.6	N 5 44.0	13.6	59.2
01	195 48.3	55.9	57 03.9	10.6	5 30.4	13.7	59.2
02	210 48.3	56.7	71 33.5	10.7	5 16.7	13.7	59.2
03	225 48.4	57.4	86 03.2	10.7	5 03.0	13.7	59.2
04	240 48.5	58.1	100 32.9	10.7	4 49.3	13.7	59.1
05	255 48.5	58.8	115 02.6	10.8	4 35.6	13.7	59.1
06	270 48.6	N15 59.6	129 32.4	10.8	N 4 21.9	13.8	59.1
07	285 48.6	16 00.3	144 02.2	10.8	4 08.1	13.7	59.1
08	300 48.7	01.0	158 32.0	10.8	3 54.4	13.8	59.1
09	315 48.8	01.7	173 01.8	10.9	3 40.6	13.9	59.1
10	330 48.8	02.4	187 31.7	10.9	3 26.7	13.8	59.1
11	345 48.9	03.2	202 01.6	10.9	3 12.9	13.8	59.1
12	0 48.9	N16 03.9	216 31.5	11.0	N 2 59.1	13.9	59.1
13	15 49.0	04.6	231 01.5	11.0	2 45.2	13.8	59.0
14	30 49.0	05.3	245 31.5	10.9	2 31.4	13.9	59.0
15	45 49.1	06.0	260 01.4	11.1	2 17.5	13.9	59.0
16	60 49.2	06.8	274 31.5	11.0	2 03.6	13.9	59.0
17	75 49.2	07.5	289 01.5	11.0	1 49.7	13.9	59.0
18	90 49.3	N16 08.2	303 31.5	11.1	N 1 35.8	13.9	59.0
19	105 49.3	08.9	318 01.6	11.1	1 21.9	13.9	59.0
20	120 49.4	09.6	332 31.7	11.1	1 08.0	13.9	59.0
21	135 49.4	10.3	347 01.8	11.1	0 54.1	13.9	59.0
22	150 49.5	11.1	1 31.9	11.2	0 40.2	13.9	58.9
23	165 49.5	11.8	16 02.1	11.1	0 26.3	13.9	58.9
5 00	180 49.6	N16 12.5	30 32.2	11.2	N 0 12.4	13.9	58.9
01	195 49.7	13.2	45 02.4	11.2	S 0 01.5	13.9	58.9
02	210 49.7	13.9	59 32.6	11.1	0 15.4	13.8	58.9
03	225 49.8	14.6	74 02.7	11.2	0 29.2	13.9	58.9
04	240 49.8	15.3	88 32.9	11.3	0 43.1	13.9	58.9
05	255 49.9	16.1	103 03.2	11.2	0 57.0	13.8	58.8
06	270 49.9	N16 16.8	117 33.4	11.2	S 1 10.8	13.9	58.8
07	285 50.0	17.5	132 03.6	11.2	1 24.7	13.8	58.8
08	300 50.0	18.2	146 33.8	11.3	1 38.5	13.8	58.8
09	315 50.1	18.9	161 04.1	11.2	1 52.3	13.8	58.8
10	330 50.1	19.6	175 34.3	11.3	2 06.1	13.8	58.8
11	345 50.2	20.3	190 04.6	11.3	2 19.9	13.7	58.8
12	0 50.2	N16 21.0	204 34.9	11.2	S 2 33.6	13.8	58.7
13	15 50.3	21.7	219 05.1	11.3	2 47.4	13.7	58.7
14	30 50.3	22.5	233 35.4	11.3	3 01.1	13.7	58.7
15	45 50.4	23.2	248 05.7	11.3	3 14.8	13.7	58.7
16	60 50.4	23.9	262 36.0	11.2	3 28.5	13.6	58.7
17	75 50.5	24.6	277 06.2	11.3	3 42.1	13.6	58.7
18	90 50.5	N16 25.3	291 36.5	11.3	S 3 55.7	13.6	58.6
19	105 50.6	26.0	306 06.8	11.3	4 09.3	13.6	58.6
20	120 50.6	26.7	320 37.1	11.3	4 22.9	13.5	58.6
21	135 50.7	27.4	335 07.4	11.2	4 36.4	13.5	58.6
22	150 50.7	28.1	349 37.6	11.3	4 49.9	13.5	58.6
23	165 50.8	28.8	4 07.9	11.3	5 03.4	13.4	58.5
6 00	180 50.8	N16 29.5	18 38.2	11.2	S 5 16.8	13.4	58.5
01	195 50.9	30.2	33 08.4	11.3	5 30.2	13.4	58.5
02	210 50.9	30.9	47 38.7	11.3	5 43.6	13.3	58.5
03	225 51.0	31.6	62 09.0	11.2	5 56.9	13.3	58.5
04	240 51.0	32.3	76 39.2	11.2	6 10.2	13.3	58.5
05	255 51.1	33.0	91 09.4	11.3	6 23.5	13.2	58.4
06	270 51.1	N16 33.7	105 39.7	11.2	S 6 36.7	13.1	58.4
07	285 51.2	34.4	120 09.9	11.2	6 49.8	13.2	58.4
08	300 51.2	35.1	134 40.1	11.2	7 03.0	13.0	58.4
09	315 51.3	35.8	149 10.3	11.2	7 16.0	13.1	58.4
10	330 51.3	36.5	163 40.5	11.2	7 29.1	12.9	58.3
11	345 51.4	37.2	178 10.7	11.2	7 42.0	13.0	58.3
12	0 51.4	N16 37.9	192 40.9	11.2	S 7 55.0	12.9	58.3
13	15 51.5	38.6	207 11.1	11.1	8 07.9	12.8	58.3
14	30 51.5	39.3	221 41.2	11.2	8 20.7	12.8	58.2
15	45 51.5	40.0	236 11.4	11.1	8 33.5	12.7	58.2
16	60 51.6	40.7	250 41.5	11.1	8 46.2	12.7	58.2
17	75 51.6	41.4	265 11.6	11.1	8 58.9	12.6	58.2
18	90 51.7	N16 42.1	279 41.7	11.1	S 9 11.5	12.6	58.2
19	105 51.7	42.8	294 11.8	11.0	9 24.1	12.5	58.1
20	120 51.8	43.5	308 41.8	11.1	9 36.6	12.4	58.1
21	135 51.8	44.2	323 11.9	11.0	9 49.0	12.4	58.1
22	150 51.9	44.9	337 41.9	11.1	10 01.4	12.3	58.1
23	165 51.9	45.6	352 12.0	11.0	S10 13.7	12.3	58.0
	SD 15.9	d 0.7	SD 16.1		16.0		15.9

V I E R N E S — S A B A D O — D O M I N G O

Lat.	Crepúsculo Náutico	Crepúsculo Civil	Orto Sol	Orto Luna 4	Orto Luna 5	Orto Luna 6	Orto Luna 7
°	h m	h m	h m	h m	h m	h m	h m
N 72	////	////	01 13	15 15	17 21	19 30	21 54
N 70	////	////	02 06	15 18	17 15	19 14	21 20
68	////	////	02 38	15 20	17 11	19 02	20 56
66	////	01 28	03 02	15 22	17 07	18 51	20 37
64	////	02 06	03 20	15 24	17 04	18 43	20 22
62	////	02 32	03 35	15 25	17 01	18 36	20 10
60	01 18	02 52	03 47	15 27	16 58	18 29	19 59
N 58	01 53	03 08	03 58	15 28	16 56	18 24	19 50
56	02 17	03 21	04 07	15 29	16 54	18 19	19 42
54	02 36	03 33	04 16	15 30	16 53	18 14	19 35
52	02 51	03 43	04 23	15 31	16 51	18 11	19 29
50	03 04	03 52	04 30	15 32	16 50	18 07	19 23
45	03 30	04 11	04 44	15 33	16 47	17 59	19 11
N 40	03 49	04 26	04 55	15 35	16 44	17 53	19 01
35	04 05	04 38	05 05	15 36	16 42	17 47	18 52
30	04 18	04 48	05 14	15 37	16 40	17 43	18 45
20	04 38	05 05	05 29	15 39	16 37	17 34	18 32
N 10	04 54	05 19	05 41	15 40	16 34	17 27	18 21
0	05 07	05 32	05 53	15 42	16 31	17 20	18 10
S 10	05 18	05 43	06 05	15 43	16 29	17 14	18 00
20	05 28	05 54	06 17	15 45	16 26	17 07	17 49
30	05 38	06 07	06 31	15 47	16 23	16 59	17 37
35	05 43	06 13	06 40	15 48	16 21	16 54	17 29
40	05 48	06 20	06 49	15 49	16 19	16 49	17 21
45	05 53	06 28	07 00	15 51	16 17	16 43	17 12
S 50	05 59	06 38	07 12	15 53	16 14	16 36	17 01
52	06 02	06 42	07 19	15 53	16 13	16 33	16 55
54	06 04	06 47	07 25	15 54	16 12	16 30	16 50
56	06 07	06 52	07 33	15 55	16 10	16 26	16 43
58	06 10	06 57	07 41	15 56	16 08	16 21	16 36
S 60	06 13	07 04	07 50	15 57	16 07	16 17	16 28

Lat.	Ocaso Sol	Crepúsculo Civil	Crepúsculo Náutico	Ocaso Luna 4	Ocaso Luna 5	Ocaso Luna 6	Ocaso Luna 7
°	h m	h m	h m	h m	h m	h m	h m
N 72	22 51	////	////	04 16	03 55	03 34	03 09
N 70	21 52	////	////	04 09	03 56	03 43	03 27
68	21 19	////	////	04 04	03 57	03 50	03 42
66	20 55	22 32	////	04 00	03 58	03 56	03 54
64	20 36	21 52	////	03 56	03 59	04 01	04 04
62	20 21	21 25	////	03 53	03 59	04 05	04 12
60	20 08	21 04	22 41	03 50	04 00	04 09	04 20
N 58	19 57	20 47	22 04	03 48	04 00	04 13	04 26
56	19 47	20 34	21 39	03 45	04 00	04 16	04 32
54	19 39	20 22	21 20	03 43	04 01	04 18	04 37
52	19 32	20 11	21 04	03 41	04 01	04 21	04 42
50	19 25	20 02	20 51	03 40	04 01	04 23	04 46
45	19 10	19 43	20 25	03 36	04 02	04 28	04 56
N 40	18 59	19 28	20 05	03 33	04 03	04 32	05 03
35	18 49	19 16	19 49	03 30	04 03	04 36	05 10
30	18 40	19 06	19 36	03 27	04 04	04 39	05 16
20	18 25	18 48	19 16	03 23	04 04	04 45	05 26
N 10	18 12	18 34	19 00	03 19	04 05	04 50	05 36
0	18 00	18 22	18 47	03 16	04 05	04 55	05 44
S 10	17 48	18 10	18 35	03 12	04 06	04 59	05 53
20	17 36	17 59	18 25	03 08	04 06	05 04	06 02
30	17 22	17 46	18 15	03 04	04 07	05 10	06 12
35	17 13	17 40	18 10	03 01	04 07	05 13	06 19
40	17 04	17 33	18 05	02 58	04 08	05 17	06 25
45	16 53	17 24	17 59	02 54	04 08	05 21	06 34
S 50	16 40	17 15	17 53	02 50	04 09	05 27	06 43
52	16 34	17 10	17 51	02 48	04 09	05 29	06 48
54	16 27	17 06	17 48	02 46	04 09	05 32	06 53
56	16 20	17 01	17 45	02 44	04 10	05 34	06 59
58	16 12	16 55	17 42	02 41	04 10	05 38	07 05
S 60	16 02	16 49	17 39	02 38	04 10	05 41	07 12

Día	SOL E.T. (+) 00h	SOL E.T. (+) 12h	SOL Pas. Mer.	LUNA Pas. Sup.	LUNA Mer. Inf.	LUNA Edad	LUNA Fase
d	m s	m s	h m	h m	h m	d	%
4	03 13	03 16	11 57	21 54	09 29	11	88
5	03 18	03 21	11 57	22 43	10 18	12	95
6	03 23	03 26	11 57	23 32	11 08	13	98

T.U.	ARIES	VENUS −4.5		MARTE −1.3		JUPITER −2.0		SATURNO +0.1	
	A.H.G.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
7 00	224 54.1	219 21.2	N 3 04.8	316 05.5	S24 26.7	151 22.1	N22 11.1	164 39.2	N18 52.3
01	239 56.6	234 22.3	05.0	331 07.8	26.8	166 24.0	11.2	179 41.4	52.3
02	254 59.0	249 23.4	05.1	346 10.1	26.9	181 25.9	11.3	194 43.5	52.4
03	270 01.5	264 24.4 . .	05.3	1 12.4 . .	27.1	196 27.8 . .	11.3	209 45.6 . .	52.5
04	285 04.0	279 25.5	05.5	16 14.7	27.2	211 29.6	11.4	224 47.8	52.5
05	300 06.4	294 26.6	05.6	31 17.1	27.3	226 31.5	11.5	239 49.9	52.6
06	315 08.9	309 27.7	N 3 05.8	46 19.4	S24 27.4	241 33.4	N22 11.5	254 52.1	N18 52.7
07	330 11.3	324 28.7	06.0	61 21.7	27.6	256 35.3	11.6	269 54.2	52.7
08	345 13.8	339 29.8	06.1	76 24.0	27.7	271 37.2	11.7	284 56.3	52.8
L 09	0 16.3	354 30.9 . .	06.3	91 26.3 . .	27.8	286 39.0 . .	11.7	299 58.5 . .	52.9
U 10	15 18.7	9 31.9	06.5	106 28.7	28.0	301 40.9	11.8	315 00.6	52.9
11	30 21.2	24 33.0	06.6	121 31.0	28.1	316 42.8	11.9	330 02.7	53.0
N 12	45 23.7	39 34.1	N 3 06.8	136 33.3	S24 28.2	331 44.7	N22 11.9	345 04.9	N18 53.1
E 13	60 26.1	54 35.1	07.0	151 35.6	28.3	346 46.6	12.0	0 07.0	53.1
14	75 28.6	69 36.2	07.2	166 38.0	28.5	1 48.4	12.1	15 09.2	53.2
S 15	90 31.1	84 37.2 . .	07.3	181 40.3 . .	28.6	16 50.3 . .	12.1	30 11.3 . .	53.3
16	105 33.5	99 38.3	07.5	196 42.6	28.7	31 52.2	12.2	45 13.4	53.3
17	120 36.0	114 39.3	07.7	211 45.0	28.9	46 54.1	12.3	60 15.6	53.4
18	135 38.5	129 40.4	N 3 07.9	226 47.3	S24 29.0	61 56.0	N22 12.3	75 17.7	N18 53.5
19	150 40.9	144 41.4	08.0	241 49.6	29.1	76 57.8	12.4	90 19.8	53.5
20	165 43.4	159 42.5	08.2	256 52.0	29.3	91 59.7	12.5	105 22.0	53.6
21	180 45.8	174 43.5 . .	08.4	271 54.3 . .	29.4	107 01.6 . .	12.5	120 24.1 . .	53.7
22	195 48.3	189 44.6	08.6	286 56.7	29.5	122 03.5	12.6	135 26.3	53.7
23	210 50.8	204 45.6	08.8	301 59.0	29.6	137 05.4	12.7	150 28.4	53.8
8 00	225 53.2	219 46.6	N 3 09.0	317 01.3	S24 29.8	152 07.2	N22 12.7	165 30.5	N18 53.9
01	240 55.7	234 47.7	09.2	332 03.7	29.9	167 09.1	12.8	180 32.7	53.9
02	255 58.2	249 48.7	09.4	347 06.0	30.0	182 11.0	12.9	195 34.8	54.0
03	271 00.6	264 49.7 . .	09.5	2 08.4 . .	30.2	197 12.9 . .	12.9	210 36.9 . .	54.1
04	286 03.1	279 50.8	09.7	17 10.7	30.3	212 14.8	13.0	225 39.1	54.1
05	301 05.6	294 51.8	09.9	32 13.1	30.4	227 16.6	13.1	240 41.2	54.2
06	316 08.0	309 52.8	N 3 10.1	47 15.4	S24 30.6	242 18.5	N22 13.1	255 43.3	N18 54.3
07	331 10.5	324 53.8	10.3	62 17.8	30.7	257 20.4	13.2	270 45.5	54.3
M 08	346 12.9	339 54.9	10.5	77 20.1	30.8	272 22.3	13.3	285 47.6	54.4
A 09	1 15.4	354 55.9 . .	10.7	92 22.5 . .	30.9	287 24.1 . .	13.3	300 49.8 . .	54.5
R 10	16 17.9	9 56.9	10.9	107 24.8	31.1	302 26.0	13.4	315 51.9	54.5
T 11	31 20.3	24 57.9	11.1	122 27.2	31.2	317 27.9	13.5	330 54.0	54.6
12	46 22.8	39 58.9	N 3 11.3	137 29.6	S24 31.3	332 29.8	N22 13.5	345 56.2	N18 54.7
E 13	61 25.3	54 59.9	11.5	152 31.9	31.5	347 31.7	13.6	0 58.3	54.7
14	76 27.7	70 01.0	11.7	167 34.3	31.6	2 33.5	13.6	16 00.4	54.8
S 15	91 30.2	85 02.0 . .	12.0	182 36.6 . .	31.7	17 35.4 . .	13.7	31 02.6 . .	54.9
16	106 32.7	100 03.0	12.2	197 39.0	31.9	32 37.3	13.8	46 04.7	54.9
17	121 35.1	115 04.0	12.4	212 41.4	32.0	47 39.2	13.8	61 06.8	55.0
18	136 37.6	130 05.0	N 3 12.6	227 43.7	S24 32.1	62 41.0	N22 13.9	76 09.0	N18 55.1
19	151 40.1	145 06.0	12.8	242 46.1	32.3	77 42.9	14.0	91 11.1	55.1
20	166 42.5	160 07.0	13.0	257 48.5	32.4	92 44.8	14.0	106 13.2	55.2
21	181 45.0	175 08.0 . .	13.2	272 50.8 . .	32.5	107 46.7 . .	14.1	121 15.4 . .	55.3
22	196 47.4	190 09.0	13.4	287 53.2	32.7	122 48.6	14.2	136 17.5	55.3
23	211 49.9	205 10.0	13.7	302 55.6	32.8	137 50.4	14.2	151 19.7	55.4
9 00	226 52.4	220 10.9	N 3 13.9	317 58.0	S24 32.9	152 52.3	N22 14.3	166 21.8	N18 55.5
01	241 54.8	235 11.9	14.1	333 00.3	33.1	167 54.2	14.4	181 23.9	55.5
02	256 57.3	250 12.9	14.3	348 02.7	33.2	182 56.1	14.4	196 26.1	55.6
03	271 59.8	265 13.9 . .	14.6	3 05.1 . .	33.3	197 57.9 . .	14.5	211 28.2 . .	55.7
04	287 02.2	280 14.9	14.8	18 07.5	33.5	212 59.8	14.6	226 30.3	55.7
05	302 04.7	295 15.9	15.0	33 09.9	33.6	228 01.7	14.6	241 32.5	55.8
06	317 07.2	310 16.8	N 3 15.2	48 12.3	S24 33.7	243 03.6	N22 14.7	256 34.6	N18 55.9
M 07	332 09.6	325 17.8	15.5	63 14.6	33.8	258 05.4	14.8	271 36.7	55.9
I 08	347 12.1	340 18.8	15.7	78 17.0	34.0	273 07.3	14.8	286 38.9	56.0
E 09	2 14.6	355 19.8 . .	15.9	93 19.4 . .	34.1	288 09.2 . .	14.9	301 41.0 . .	56.1
R 10	17 17.0	10 20.7	16.2	108 21.8	34.2	303 11.1	14.9	316 43.1	56.1
C 11	32 19.5	25 21.7	16.4	123 24.2	34.4	318 13.0	15.0	331 45.3	56.2
O 12	47 21.9	40 22.7	N 3 16.6	138 26.6	S24 34.5	333 14.8	N22 15.1	346 47.4	N18 56.3
L 13	62 24.4	55 23.6	16.9	153 29.0	34.6	348 16.7	15.1	1 49.6	56.3
E 14	77 26.9	70 24.6	17.1	168 31.4	34.8	3 18.6	15.2	16 51.7	56.4
S 15	92 29.3	85 25.6 . .	17.3	183 33.8 . .	34.9	18 20.5 . .	15.3	31 53.8 . .	56.5
16	107 31.8	100 26.5	17.6	198 36.2	35.0	33 22.3	15.3	46 56.0	56.5
17	122 34.3	115 27.5	17.8	213 38.6	35.2	48 24.2	15.4	61 58.1	56.6
18	137 36.7	130 28.5	N 3 18.1	228 41.0	S24 35.3	63 26.1	N22 15.5	77 00.2	N18 56.7
19	152 39.2	145 29.4	18.3	243 43.4	35.4	78 28.0	15.5	92 02.4	56.7
20	167 41.7	160 30.4	18.6	258 45.8	35.6	93 29.8	15.6	107 04.5	56.8
21	182 44.1	175 31.3 . .	18.8	273 48.2 . .	35.7	108 31.7 . .	15.7	122 06.6 . .	56.8
22	197 46.6	190 32.3	19.0	288 50.6	35.8	123 33.6	15.7	137 08.8	56.9
23	212 49.1	205 33.2	19.3	303 53.0	36.0	138 35.5	15.8	152 10.9	57.0
	h m								
Pas. Mer.	8 55.0	v 1.0	d 0.2	v 2.4	d 0.1	v 1.9	d 0.1	v 2.1	d 0.1

ESTRELLAS

Nombre	A.H.S.	Dec.
	° ′	° ′
Acamar	315 26.0	S40 18.1
Achernar	335 34.3	S57 13.8
Acrux	173 19.6	S63 06.5
Adhara	255 20.2	S28 58.6
Aldebaran	291 00.7	N16 30.6
Alioth	166 28.5	N55 57.4
Alkaid	153 05.9	N49 18.6
Al Na'ir	27 55.7	S46 57.2
Alnilam	275 56.3	S 1 12.2
Alphard	218 05.4	S 8 39.9
Alphecca	126 18.7	N26 42.6
Alpheratz	357 53.7	N29 05.6
Altair	62 17.4	N 8 52.1
Ankaa	353 25.4	S42 18.0
Antares	112 37.6	S26 26.1
Arcturus	146 04.1	N19 10.6
Atria	107 47.6	S69 01.7
Avior	234 22.1	S59 31.1
Bellatrix	278 42.5	N 6 20.9
Betelgeuse	271 11.9	N 7 24.3
Canopus	264 00.8	S52 42.0
Capella	280 49.0	N46 00.0
Deneb	49 37.9	N45 16.8
Denebola	182 43.2	N14 34.0
Diphda	349 05.7	S17 58.9
Dubhe	194 02.9	N61 44.9
Elnath	278 25.0	N28 36.5
Eltanin	90 50.2	N51 29.1
Enif	33 56.5	N 9 52.6
Fomalhaut	15 34.6	S29 36.9
Gacrux	172 11.2	S57 07.4
Gienah	176 01.9	S17 33.0
Hadar	149 00.9	S60 22.8
Hamal	328 11.9	N23 27.9
Kaus Aust.	83 56.2	S34 23.0
Kochab	137 18.3	N74 09.1
Markab	13 48.0	N15 12.5
Menkar	314 25.4	N 4 05.5
Menkent	148 18.5	S36 22.6
Miaplacidus	221 41.8	S69 43.6
Mirfak	308 54.6	N49 51.8
Nunki	76 09.9	S26 17.7
Peacock	53 34.0	S56 43.7
Pollux	243 39.5	N28 01.5
Procyon	245 09.8	N 5 13.3
Rasalhague	96 15.0	N12 33.5
Regulus	207 53.6	N11 57.7
Rigel	281 21.5	S 8 12.2
Rigil Kent.	140 04.3	S60 50.4
Sabik	102 23.2	S15 43.6
Schedar	349 52.0	N56 32.3
Shaula	96 34.5	S37 06.2
Sirius	258 42.4	S16 43.2
Spica	158 41.0	S11 10.1
Suhail	222 59.5	S43 26.5
Vega	80 45.1	N38 46.9
Zuben'ubi	137 15.7	S16 02.8

	A.H.S.	Pas. Mer.
	° ′	h m
Venus	353 53.4	9 20
Marte	91 08.1	2 51
Júpiter	286 14.0	13 50
Saturno	299 37.3	12 56

T.U.	SOL A.H.G.	SOL Dec.	LUNA A.H.G.	LUNA v	LUNA Dec.	LUNA d	LUNA P.H.
d h	° ′	° ′	° ′	′	° ′	′	′
LUNES 7 00	180 51.9	N16 46.2	6 42.0	11.0	S10 26.0	12.1	58.0
01	195 52.0	46.9	21 12.0	10.9	10 38.1	12.2	58.0
02	210 52.0	47.6	35 41.9	11.0	10 50.3	12.0	58.0
03	225 52.1	48.3	50 11.9	10.9	11 02.3	12.0	58.0
04	240 52.1	49.0	64 41.8	10.9	11 14.3	12.0	57.9
05	255 52.2	49.7	79 11.7	10.9	11 26.3	11.8	57.9
06	270 52.2	N16 50.4	93 41.6	10.9	S11 38.1	11.8	57.9
07	285 52.2	51.1	108 11.5	10.8	11 49.9	11.7	57.9
08	300 52.3	51.8	122 41.3	10.9	12 01.6	11.7	57.8
09	315 52.3	52.5	137 11.2	10.8	12 13.3	11.5	57.8
10	330 52.4	53.1	151 41.0	10.8	12 24.8	11.5	57.8
11	345 52.4	53.8	166 10.8	10.8	12 36.3	11.5	57.8
12	0 52.4	N16 54.5	180 40.6	10.7	S12 47.8	11.3	57.7
13	15 52.5	55.2	195 10.3	10.7	12 59.1	11.3	57.7
14	30 52.5	55.9	209 40.0	10.7	13 10.4	11.2	57.7
15	45 52.6	56.6	224 09.7	10.7	13 21.6	11.1	57.7
16	60 52.6	57.2	238 39.4	10.7	13 32.7	11.0	57.6
17	75 52.6	57.9	253 09.1	10.6	13 43.7	11.0	57.6
18	90 52.7	N16 58.6	267 38.7	10.6	S13 54.7	10.8	57.6
19	105 52.7	16 59.3	282 08.3	10.6	14 05.5	10.8	57.6
20	120 52.8	17 00.0	296 37.9	10.6	14 16.3	10.7	57.5
21	135 52.8	00.7	311 07.5	10.6	14 27.0	10.6	57.5
22	150 52.8	01.3	325 37.1	10.5	14 37.6	10.5	57.5
23	165 52.9	02.0	340 06.6	10.5	14 48.1	10.5	57.5
MARTES 8 00	180 52.9	N17 02.7	354 36.1	10.5	S14 58.6	10.3	57.4
01	195 52.9	03.4	9 05.6	10.4	15 08.9	10.3	57.4
02	210 53.0	04.1	23 35.0	10.5	15 19.2	10.2	57.4
03	225 53.0	04.7	38 04.5	10.4	15 29.4	10.0	57.4
04	240 53.1	05.4	52 33.9	10.4	15 39.4	10.0	57.3
05	255 53.1	06.1	67 03.3	10.3	15 49.4	9.9	57.3
06	270 53.1	N17 06.8	81 32.6	10.4	S15 59.3	9.8	57.3
07	285 53.2	07.5	96 02.0	10.3	16 09.1	9.7	57.3
08	300 53.2	08.1	110 31.3	10.3	16 18.8	9.6	57.2
09	315 53.2	08.8	125 00.6	10.3	16 28.4	9.6	57.2
10	330 53.3	09.5	139 29.9	10.2	16 38.0	9.4	57.2
11	345 53.3	10.2	153 59.1	10.2	16 47.4	9.3	57.1
12	0 53.3	N17 10.8	168 28.3	10.2	S16 56.7	9.2	57.1
13	15 53.4	11.5	182 57.5	10.2	17 05.9	9.2	57.1
14	30 53.4	12.2	197 26.7	10.2	17 15.1	9.0	57.1
15	45 53.4	12.8	211 55.9	10.1	17 24.1	8.9	57.0
16	60 53.5	13.5	226 25.0	10.1	17 33.0	8.8	57.0
17	75 53.5	14.2	240 54.1	10.1	17 41.8	8.8	57.0
18	90 53.5	N17 14.9	255 23.2	10.1	S17 50.6	8.6	57.0
19	105 53.6	15.5	269 52.3	10.1	17 59.2	8.5	56.9
20	120 53.6	16.2	284 21.4	10.0	18 07.7	8.4	56.9
21	135 53.6	16.9	298 50.4	10.0	18 16.1	8.3	56.9
22	150 53.7	17.5	313 19.4	10.0	18 24.4	8.2	56.9
23	165 53.7	18.2	327 48.4	10.0	18 32.6	8.1	56.8
MIERCOLES 9 00	180 53.7	N17 18.9	342 17.4	9.9	S18 40.7	8.0	56.8
01	195 53.8	19.5	356 46.3	9.9	18 48.7	7.9	56.8
02	210 53.8	20.2	11 15.2	10.0	18 56.6	7.8	56.7
03	225 53.8	20.9	25 44.2	9.9	19 04.4	7.6	56.7
04	240 53.9	21.5	40 13.1	9.8	19 12.0	7.6	56.7
05	255 53.9	22.2	54 41.9	9.9	19 19.6	7.4	56.7
06	270 53.9	N17 22.9	69 10.8	9.8	S19 27.0	7.4	56.6
07	285 53.9	23.5	83 39.6	9.9	19 34.4	7.2	56.6
08	300 54.0	24.2	98 08.5	9.8	19 41.6	7.1	56.6
09	315 54.0	24.9	112 37.3	9.8	19 48.7	7.0	56.6
10	330 54.0	25.5	127 06.1	9.8	19 55.7	6.9	56.5
11	345 54.1	26.2	141 34.9	9.7	20 02.6	6.8	56.5
12	0 54.1	N17 26.9	156 03.6	9.8	S20 09.4	6.6	56.5
13	15 54.1	27.5	170 32.4	9.7	20 16.0	6.6	56.4
14	30 54.1	28.2	185 01.1	9.7	20 22.6	6.4	56.4
15	45 54.2	28.8	199 29.8	9.8	20 29.0	6.3	56.4
16	60 54.2	29.5	213 58.6	9.7	20 35.3	6.2	56.4
17	75 54.2	30.2	228 27.3	9.6	20 41.5	6.1	56.3
18	90 54.3	N17 30.8	242 55.9	9.7	S20 47.6	6.0	56.3
19	105 54.3	31.5	257 24.6	9.7	20 53.6	5.9	56.3
20	120 54.3	32.1	271 53.3	9.6	20 59.5	5.7	56.3
21	135 54.3	32.8	286 21.9	9.7	21 05.2	5.6	56.2
22	150 54.4	33.5	300 50.6	9.6	21 10.8	5.5	56.2
23	165 54.4	34.1	315 19.2	9.7	S21 16.3	5.4	56.2
	SD 15.9	d 0.7	SD 15.7		15.6		15.4

Lat.	Crepúsculo Náutico	Crepúsculo Civil	Orto Sol	Orto Luna 7	Orto Luna 8	Orto Luna 9	Orto Luna 10
°	h m	h m	h m	h m	h m	h m	h m
N 72	////	////	00 23	21 54	▬	▬	▬
N 70	////	////	01 46	21 20	23 47	▬	▬
68	////	////	02 24	20 56	22 55	25 17	01 17
66	////	01 03	02 50	20 37	22 24	24 10	00 10
64	////	01 50	03 10	20 22	22 00	23 34	24 56
62	////	02 20	03 26	20 10	21 42	23 09	24 24
60	00 56	02 42	03 39	19 59	21 27	22 49	24 01
N 58	01 39	02 59	03 51	19 50	21 14	22 33	23 42
56	02 06	03 14	04 01	19 42	21 03	22 19	23 26
54	02 27	03 26	04 10	19 35	20 53	22 07	23 12
52	02 43	03 37	04 18	19 29	20 45	21 56	23 01
50	02 57	03 47	04 25	19 23	20 37	21 47	22 50
45	03 25	04 06	04 40	19 11	20 21	21 27	22 28
N 40	03 45	04 22	04 52	19 01	20 07	21 11	22 11
35	04 02	04 35	05 02	18 52	19 56	20 58	21 56
30	04 15	04 46	05 11	18 45	19 46	20 46	21 43
20	04 36	05 04	05 27	18 32	19 29	20 26	21 21
N 10	04 53	05 18	05 40	18 21	19 15	20 09	21 02
0	05 06	05 31	05 53	18 10	19 01	19 53	20 45
S 10	05 18	05 43	06 05	18 00	18 48	19 37	20 27
20	05 29	05 55	06 18	17 49	18 33	19 20	20 08
30	05 40	06 08	06 33	17 37	18 17	19 00	19 47
35	05 45	06 15	06 42	17 29	18 07	18 49	19 34
40	05 51	06 23	06 52	17 21	17 56	18 36	19 20
45	05 57	06 32	07 03	17 12	17 44	18 20	19 03
S 50	06 03	06 42	07 17	17 01	17 28	18 02	18 41
52	06 06	06 47	07 23	16 55	17 21	17 53	18 31
54	06 09	06 52	07 30	16 50	17 13	17 43	18 20
56	06 12	06 57	07 38	16 43	17 05	17 32	18 07
58	06 15	07 03	07 47	16 36	16 55	17 19	17 52
S 60	06 19	07 10	07 57	16 28	16 43	17 04	17 34

Lat.	Ocaso Sol	Crepúsculo Civil	Crepúsculo Náutico	Ocaso Luna 7	Ocaso Luna 8	Ocaso Luna 9	Ocaso Luna 10
°	h m	h m	h m	h m	h m	h m	h m
N 72	▭	▭	▭	03 09	02 31	▬	▬
N 70	22 13	////	////	03 27	03 07	02 27	▬
68	21 33	////	////	03 42	03 32	03 19	02 46
66	21 06	22 59	////	03 54	03 52	03 51	03 53
64	20 45	22 07	////	04 04	04 08	04 15	04 29
62	20 29	21 36	////	04 12	04 21	04 34	04 55
60	20 15	21 14	23 05	04 20	04 33	04 50	05 15
N 58	20 03	20 56	22 18	04 26	04 43	05 04	05 32
56	19 53	20 41	21 50	04 32	04 51	05 15	05 46
54	19 44	20 28	21 28	04 37	04 59	05 25	05 58
52	19 36	20 17	21 11	04 42	05 06	05 34	06 09
50	19 29	20 07	20 57	04 46	05 12	05 42	06 19
45	19 14	19 47	20 29	04 56	05 26	06 00	06 39
N 40	19 02	19 32	20 09	05 03	05 37	06 14	06 56
35	18 51	19 19	19 52	05 10	05 47	06 26	07 10
30	18 42	19 08	19 39	05 16	05 55	06 37	07 22
20	18 26	18 50	19 17	05 26	06 10	06 55	07 43
N 10	18 13	18 35	19 00	05 36	06 22	07 11	08 01
0	18 00	18 22	18 47	05 44	06 34	07 26	08 18
S 10	17 47	18 09	18 35	05 53	06 47	07 41	08 35
20	17 34	17 57	18 24	06 02	06 59	07 57	08 53
30	17 19	17 44	18 13	06 12	07 14	08 15	09 14
35	17 11	17 37	18 08	06 19	07 23	08 26	09 26
40	17 01	17 29	18 02	06 25	07 33	08 38	09 40
45	16 49	17 21	17 56	06 34	07 44	08 53	09 57
S 50	16 35	17 10	17 49	06 43	07 59	09 11	10 18
52	16 29	17 06	17 46	06 48	08 05	09 19	10 28
54	16 22	17 01	17 43	06 53	08 13	09 29	10 39
56	16 14	16 55	17 40	06 59	08 21	09 40	10 51
58	16 05	16 49	17 37	07 05	08 30	09 52	11 06
S 60	15 55	16 42	17 33	07 12	08 41	10 06	11 24

Día	SOL E. T. (+) 00h	SOL E. T. (+) 12h	SOL Pas. Mer.	LUNA Pas. Mer. Sup.	LUNA Pas. Mer. Inf.	LUNA Edad	LUNA Fase
d	m s	m s	h m	h m	h m	d %	
7	03 28	03 30	11 57	24 22	11 57	14 100	◯
8	03 32	03 33	11 56	00 22	12 48	15 99	
9	03 35	03 36	11 56	01 13	13 39	16 96	

T.U.	ARIES	VENUS −4.5		MARTE −1.4		JUPITER −2.0		SATURNO +0.1	
	A.H.G.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
10 00	227 51.5	220 34.2	N 3 19.5	318 55.4	S24 36.1	153 37.3	N22 15.9	167 13.0	N18 57.0
01	242 54.0	235 35.1	19.8	333 57.8	36.2	168 39.2	15.9	182 15.2	57.1
02	257 56.4	250 36.0	20.0	349 00.2	36.4	183 41.1	16.0	197 17.3	57.2
03	272 58.9	265 37.0 . .	20.3	4 02.6 . .	36.5	198 43.0 . .	16.0	212 19.4 . .	57.2
04	288 01.4	280 37.9	20.6	19 05.0	36.7	213 44.8	16.1	227 21.6	57.3
05	303 03.8	295 38.9	20.8	34 07.5	36.8	228 46.7	16.2	242 23.7	57.4
06	318 06.3	310 39.8	N 3 21.1	49 09.9	S24 36.9	243 48.6	N22 16.2	257 25.8	N18 57.4
07	333 08.8	325 40.7	21.3	64 12.3	37.1	258 50.5	16.3	272 28.0	57.5
J 08	348 11.2	340 41.6	21.6	79 14.7	37.2	273 52.3	16.4	287 30.1	57.6
U 09	3 13.7	355 42.6 . .	21.9	94 17.1 . .	37.3	288 54.2 . .	16.4	302 32.3 . .	57.6
E 10	18 16.2	10 43.5	22.1	109 19.5	37.5	303 56.1	16.5	317 34.4	57.7
V 11	33 18.6	25 44.4	22.4	124 22.0	37.6	318 58.0	16.6	332 36.5	57.8
12	48 21.1	40 45.4	N 3 22.6	139 24.4	S24 37.7	333 59.8	N22 16.6	347 38.7	N18 57.8
E 13	63 23.5	55 46.3	22.9	154 26.8	37.9	349 01.7	16.7	2 40.8	57.9
14	78 26.0	70 47.2	23.2	169 29.3	38.0	4 03.6	16.7	17 42.9	58.0
S 15	93 28.5	85 48.1 . .	23.4	184 31.7 . .	38.1	19 05.4 . .	16.8	32 45.1 . .	58.0
16	108 30.9	100 49.0	23.7	199 34.1	38.3	34 07.3	16.9	47 47.2	58.1
17	123 33.4	115 49.9	24.0	214 36.5	38.4	49 09.2	16.9	62 49.3	58.2
18	138 35.9	130 50.9	N 3 24.3	229 39.0	S24 38.5	64 11.1	N22 17.0	77 51.5	N18 58.2
19	153 38.3	145 51.8	24.5	244 41.4	38.7	79 12.9	17.1	92 53.6	58.3
20	168 40.8	160 52.7	24.8	259 43.8	38.8	94 14.8	17.1	107 55.7	58.4
21	183 43.3	175 53.6 . .	25.1	274 46.3 . .	38.9	109 16.7 . .	17.2	122 57.9 . .	58.4
22	198 45.7	190 54.5	25.4	289 48.7	39.1	124 18.6	17.3	138 00.0	58.5
23	213 48.2	205 55.4	25.6	304 51.2	39.2	139 20.4	17.3	153 02.1	58.6
11 00	228 50.7	220 56.3	N 3 25.9	319 53.6	S24 39.4	154 22.3	N22 17.4	168 04.3	N18 58.6
01	243 53.1	235 57.2	26.2	334 56.1	39.5	169 24.2	17.5	183 06.4	58.7
02	258 55.6	250 58.1	26.5	349 58.5	39.6	184 26.1	17.5	198 08.5	58.8
03	273 58.0	265 59.0 . .	26.8	5 00.9 . .	39.8	199 27.9 . .	17.6	213 10.7 . .	58.8
04	289 00.5	280 59.9	27.1	20 03.4	39.9	214 29.8	17.6	228 12.8	58.9
05	304 03.0	296 00.8	27.3	35 05.8	40.0	229 31.7	17.7	243 14.9	59.0
06	319 05.4	311 01.7	N 3 27.6	50 08.3	S24 40.2	244 33.5	N22 17.8	258 17.1	N18 59.0
07	334 07.9	326 02.6	27.9	65 10.7	40.3	259 35.4	17.8	273 19.2	59.1
V 08	349 10.4	341 03.5	28.2	80 13.2	40.4	274 37.3	17.9	288 21.3	59.2
I 09	4 12.8	356 04.3 . .	28.5	95 15.6 . .	40.6	289 39.2 . .	18.0	303 23.5 . .	59.2
E 10	19 15.3	11 05.2	28.8	110 18.1	40.7	304 41.0	18.0	318 25.6	59.3
R 11	34 17.8	26 06.1	29.1	125 20.6	40.9	319 42.9	18.1	333 27.7	59.4
N 12	49 20.2	41 07.0	N 3 29.4	140 23.0	S24 41.0	334 44.8	N22 18.1	348 29.9	N18 59.4
E 13	64 22.7	56 07.9	29.7	155 25.5	41.1	349 46.6	18.2	3 32.0	59.5
S 14	79 25.2	71 08.7	30.0	170 27.9	41.3	4 48.5	18.3	18 34.1	59.5
15	94 27.6	86 09.6 . .	30.3	185 30.4 . .	41.4	19 50.4 . .	18.3	33 36.3 . .	59.6
16	109 30.1	101 10.5	30.6	200 32.9	41.5	34 52.3	18.4	48 38.4	59.7
17	124 32.5	116 11.4	30.9	215 35.3	41.7	49 54.1	18.5	63 40.5	59.7
18	139 35.0	131 12.2	N 3 31.2	230 37.8	S24 41.8	64 56.0	N22 18.5	78 42.7	N18 59.8
19	154 37.5	146 13.1	31.5	245 40.3	41.9	79 57.9	18.6	93 44.8	59.9
20	169 39.9	161 14.0	31.8	260 42.7	42.1	94 59.7	18.7	108 46.9	18 59.9
21	184 42.4	176 14.8 . .	32.1	275 45.2 . .	42.2	110 01.6 . .	18.7	123 49.1	19 00.0
22	199 44.9	191 15.7	32.4	290 47.7	42.4	125 03.5	18.8	138 51.2	00.1
23	214 47.3	206 16.6	32.7	305 50.2	42.5	140 05.4	18.8	153 53.3	00.1
12 00	229 49.8	221 17.4	N 3 33.0	320 52.6	S24 42.6	155 07.2	N22 18.9	168 55.5	N19 00.2
01	244 52.3	236 18.3	33.3	335 55.1	42.8	170 09.1	19.0	183 57.6	00.3
02	259 54.7	251 19.2	33.6	350 57.6	42.9	185 11.0	19.0	198 59.7	00.3
03	274 57.2	266 20.0 . .	33.9	6 00.1 . .	43.1	200 12.8 . .	19.1	214 01.9 . .	00.4
04	289 59.7	281 20.9	34.2	21 02.6	43.2	215 14.7	19.2	229 04.0	00.5
05	305 02.1	296 21.7	34.5	36 05.0	43.3	230 16.6	19.2	244 06.1	00.5
06	320 04.6	311 22.6	N 3 34.9	51 07.5	S24 43.5	245 18.5	N22 19.3	259 08.3	N19 00.6
S 07	335 07.0	326 23.4	35.2	66 10.0	43.6	260 20.3	19.3	274 10.4	00.7
08	350 09.5	341 24.3	35.5	81 12.5	43.7	275 22.2	19.4	289 12.5	00.7
A 09	5 12.0	356 25.1 . .	35.8	96 15.0 . .	43.9	290 24.1 . .	19.5	304 14.7 . .	00.8
10	20 14.4	11 26.0	36.1	111 17.5	44.0	305 25.9	19.5	319 16.8	00.9
B 11	35 16.9	26 26.8	36.5	126 20.0	44.2	320 27.8	19.6	334 18.9	00.9
12	50 19.4	41 27.6	N 3 36.8	141 22.5	S24 44.3	335 29.7	N22 19.7	349 21.1	N19 01.0
A 13	65 21.8	56 28.5	37.1	156 24.9	44.4	350 31.5	19.7	4 23.2	01.1
D 14	80 24.3	71 29.3	37.4	171 27.4	44.6	5 33.4	19.8	19 25.3	01.1
15	95 26.8	86 30.1 . .	37.7	186 29.9 . .	44.7	20 35.3 . .	19.8	34 27.5 . .	01.2
O 16	110 29.2	101 31.0	38.1	201 32.4	44.8	35 37.2	19.9	49 29.6	01.3
17	125 31.7	116 31.8	38.4	216 34.9	45.0	50 39.0	20.0	64 31.7	01.3
18	140 34.2	131 32.6	N 3 38.7	231 37.4	S24 45.1	65 40.9	N22 20.0	79 33.9	N19 01.4
19	155 36.6	146 33.5	39.1	246 39.9	45.3	80 42.8	20.1	94 36.0	01.4
20	170 39.1	161 34.3	39.4	261 42.4	45.4	95 44.6	20.2	109 38.1	01.5
21	185 41.5	176 35.1 . .	39.7	276 45.0 . .	45.5	110 46.5 . .	20.2	124 40.3 . .	01.6
22	200 44.0	191 36.0	40.1	291 47.5	45.7	125 48.4	20.3	139 42.4	01.6
23	215 46.5	206 36.8	40.4	306 50.0	45.8	140 50.2	20.3	154 44.5	01.7
Pas. Mer.	h m 8 43.2	*v* 0.9	*d* 0.3	*v* 2.5	*d* 0.1	*v* 1.9	*d* 0.1	*v* 2.1	*d* 0.1

ESTRELLAS

Nombre	A.H.S.	Dec.
	° ′	° ′
Acamar	315 25.9	S40 18.1
Achernar	335 34.3	S57 13.8
Acrux	173 19.6	S63 06.5
Adhara	255 20.3	S28 58.6
Aldebaran	291 00.7	N16 30.6
Alioth	166 28.5	N55 57.4
Alkaid	153 05.9	N49 18.6
Al Na'ir	27 55.7	S46 57.2
Alnilam	275 56.3	S 1 12.2
Alphard	218 05.5	S 8 39.9
Alphecca	126 18.7	N26 42.6
Alpheratz	357 53.6	N29 05.6
Altair	62 17.4	N 8 52.2
Ankaa	353 25.3	S42 17.9
Antares	112 37.6	S26 26.1
Arcturus	146 04.1	N19 10.6
Atria	107 47.6	S69 01.7
Avior	234 22.1	S59 31.1
Bellatrix	278 42.5	N 6 20.9
Betelgeuse	271 11.9	N 7 24.3
Canopus	264 00.8	S52 42.0
Capella	280 49.0	N46 00.0
Deneb	49 37.9	N45 16.8
Denebola	182 43.2	N14 34.0
Diphda	349 05.7	S17 58.9
Dubhe	194 02.9	N61 44.9
Elnath	278 25.0	N28 36.5
Eltanin	90 50.1	N51 29.2
Enif	33 56.5	N 9 52.6
Fomalhaut	15 34.6	S29 36.9
Gacrux	172 11.2	S57 07.4
Gienah	176 01.9	S17 33.0
Hadar	149 00.9	S60 22.8
Hamal	328 11.9	N23 27.9
Kaus Aust.	83 56.1	S34 23.0
Kochab	137 18.3	N74 09.1
Markab	13 48.0	N15 12.5
Menkar	314 25.3	N 4 05.5
Menkent	148 18.5	S36 22.6
Miaplacidus	221 41.9	S69 43.6
Mirfak	308 54.6	N49 51.8
Nunki	76 09.9	S26 17.7
Peacock	53 34.0	S56 43.7
Pollux	243 39.5	N28 01.5
Procyon	245 09.9	N 5 13.3
Rasalhague	96 15.0	N12 33.5
Regulus	207 53.6	N11 57.7
Rigel	281 21.5	S 8 12.2
Rigil Kent.	140 04.3	S60 50.4
Sabik	102 23.2	S15 43.6
Schedar	349 51.9	N56 32.3
Shaula	96 34.5	S37 06.2
Sirius	258 42.4	S16 43.2
Spica	158 41.0	S11 10.1
Suhail	222 59.5	S43 26.5
Vega	80 45.1	N38 46.9
Zuben'ubi	137 15.7	S16 02.8

	A.H.S.	Pas. Mer.
	° ′	h m
Venus	352 05.6	9 16
Marte	91 03.0	2 40
Júpiter	285 31.6	13 41
Saturno	299 13.6	12 46

T.U.	SOL				LUNA					
	A.H.G.		Dec.		A.H.G.	v	Dec.	d	P.H.	
d h	°	′	°	′	°	′	′	°	′	′	′
10 00	180	54.4	N17	34.8	329	47.9	9.6	S21	21.7	5.3	56.2
01	195	54.4		35.4	344	16.5	9.6	21	27.0	5.1	56.1
02	210	54.5		36.1	358	45.1	9.6	21	32.1	5.1	56.1
03	225	54.5	. .	36.7	13	13.7	9.7	21	37.2	4.9	56.1
04	240	54.5		37.4	27	42.4	9.6	21	42.1	4.8	56.0
05	255	54.5		38.0	42	11.0	9.6	21	46.9	4.6	56.0
06	270	54.6	N17	38.7	56	39.6	9.6	S21	51.5	4.6	56.0
07	285	54.6		39.3	71	08.2	9.6	21	56.1	4.4	56.0
J 08	300	54.6		40.0	85	36.8	9.6	22	00.5	4.4	55.9
U 09	315	54.6	. .	40.6	100	05.4	9.6	22	04.9	4.2	55.9
10	330	54.6		41.3	114	34.0	9.6	22	09.1	4.0	55.9
E 11	345	54.7		41.9	129	02.6	9.6	22	13.1	4.0	55.9
V 12	0	54.7	N17	42.6	143	31.2	9.6	S22	17.1	3.8	55.8
13	15	54.7		43.2	157	59.8	9.6	22	20.9	3.7	55.8
E 14	30	54.7		43.9	172	28.4	9.6	22	24.6	3.6	55.8
15	45	54.8	. .	44.5	186	57.0	9.6	22	28.2	3.5	55.8
S 16	60	54.8		45.2	201	25.6	9.6	22	31.7	3.3	55.7
17	75	54.8		45.8	215	54.2	9.6	22	35.0	3.3	55.7
18	90	54.8	N17	46.5	230	22.8	9.7	S22	38.3	3.1	55.7
19	105	54.8		47.1	244	51.5	9.6	22	41.4	3.0	55.7
20	120	54.9		47.8	259	20.1	9.7	22	44.4	2.8	55.6
21	135	54.9	. .	48.4	273	48.8	9.6	22	47.2	2.8	55.6
22	150	54.9		49.1	288	17.4	9.7	22	50.0	2.6	55.6
23	165	54.9		49.7	302	46.1	9.6	22	52.6	2.5	55.6
11 00	180	54.9	N17	50.4	317	14.7	9.7	S22	55.1	2.4	55.5
01	195	55.0		51.0	331	43.4	9.7	22	57.5	2.3	55.5
02	210	55.0		51.6	346	12.1	9.7	22	59.8	2.1	55.5
03	225	55.0	. .	52.3	0	40.8	9.8	23	01.9	2.0	55.5
04	240	55.0		52.9	15	09.6	9.7	23	03.9	1.9	55.5
05	255	55.0		53.6	29	38.3	9.8	23	05.8	1.8	55.4
06	270	55.0	N17	54.2	44	07.1	9.7	S23	07.6	1.6	55.4
07	285	55.1		54.8	58	35.8	9.8	23	09.2	1.6	55.4
V 08	300	55.1		55.5	73	04.6	9.8	23	10.8	1.4	55.4
I 09	315	55.1	. .	56.1	87	33.4	9.9	23	12.2	1.3	55.3
E 10	330	55.1		56.8	102	02.3	9.8	23	13.5	1.2	55.3
R 11	345	55.1		57.4	116	31.1	9.9	23	14.7	1.0	55.3
N 12	0	55.1	N17	58.0	131	00.0	9.9	S23	15.7	1.0	55.3
E 13	15	55.2		58.7	145	28.9	9.9	23	16.7	0.8	55.2
S 14	30	55.2	17	59.3	159	57.8	9.9	23	17.5	0.7	55.2
15	45	55.2	18	00.0	174	26.7	10.0	23	18.2	0.6	55.2
16	60	55.2		00.6	188	55.7	9.9	23	18.8	0.4	55.2
17	75	55.2		01.2	203	24.6	10.1	23	19.2	0.4	55.2
18	90	55.2	N18	01.9	217	53.7	10.0	S23	19.6	0.2	55.1
19	105	55.3		02.5	232	22.7	10.0	23	19.8	0.1	55.1
20	120	55.3		03.1	246	51.7	10.1	23	19.9	0.0	55.1
21	135	55.3	. .	03.8	261	20.8	10.1	23	19.9	0.2	55.1
22	150	55.3		04.4	275	49.9	10.2	23	19.7	0.2	55.1
23	165	55.3		05.0	290	19.1	10.1	23	19.5	0.4	55.0
12 00	180	55.3	N18	05.7	304	48.2	10.2	S23	19.1	0.5	55.0
01	195	55.3		06.3	319	17.4	10.3	23	18.6	0.6	55.0
02	210	55.3		06.9	333	46.7	10.2	23	18.0	0.7	55.0
03	225	55.4	. .	07.5	348	15.9	10.3	23	17.3	0.8	55.0
04	240	55.4		08.2	2	45.2	10.4	23	16.5	0.9	54.9
05	255	55.4		08.8	17	14.6	10.3	23	15.6	1.1	54.9
06	270	55.4	N18	09.4	31	43.9	10.4	S23	14.5	1.2	54.9
07	285	55.4		10.1	46	13.3	10.4	23	13.3	1.3	54.9
S 08	300	55.4		10.7	60	42.7	10.5	23	12.0	1.4	54.9
A 09	315	55.4	. .	11.3	75	12.2	10.5	23	10.6	1.5	54.9
B 10	330	55.4		11.9	89	41.7	10.5	23	09.1	1.6	54.8
A 11	345	55.4		12.6	104	11.2	10.6	23	07.5	1.8	54.8
D 12	0	55.5	N18	13.2	118	40.8	10.6	S23	05.7	1.8	54.8
O 13	15	55.5		13.8	133	10.4	10.7	23	03.9	2.0	54.8
14	30	55.5		14.4	147	40.1	10.6	23	01.9	2.0	54.8
15	45	55.5	. .	15.1	162	09.7	10.8	22	59.9	2.2	54.7
16	60	55.5		15.7	176	39.5	10.7	22	57.7	2.3	54.7
17	75	55.5		16.3	191	09.2	10.8	22	55.4	2.4	54.7
18	90	55.5	N18	16.9	205	39.0	10.9	S22	53.0	2.5	54.7
19	105	55.5		17.5	220	08.9	10.9	22	50.5	2.7	54.7
20	120	55.5		18.2	234	38.8	10.9	22	47.8	2.7	54.7
21	135	55.5	. .	18.8	249	08.7	11.0	22	45.1	2.8	54.7
22	150	55.5		19.4	263	38.7	11.0	22	42.3	3.0	54.6
23	165	55.6		20.0	278	08.7	11.0	S22	39.3	3.0	54.6
	SD	15.9	d	0.6	SD		15.2		15.1		14.9

Lat.	Crepúsculo Náutico	Crepúsculo Civil	Orto Sol	Orto Luna 10	Orto Luna 11	Orto Luna 12	Orto Luna 13
°	h m	h m	h m	h m	h m	h m	h m
N 72	▭	▭	▭	▬	▬	▬	▬
N 70	////	////	01 23	▬	▬	▬	▬
68	////	////	02 08	01 17	▬	▬	▬
66	////	00 24	02 38	00 10	01 48	02 52	03 10
64	////	01 34	03 00	24 56	00 56	01 55	02 28
62	////	02 08	03 17	24 24	00 24	01 22	01 59
60	00 21	02 32	03 32	24 01	00 01	00 57	01 37
N 58	01 24	02 51	03 44	23 42	24 38	00 38	01 20
56	01 55	03 07	03 55	23 26	24 21	00 21	01 04
54	02 18	03 20	04 04	23 12	24 08	00 08	00 51
52	02 36	03 31	04 12	23 01	23 55	24 40	00 40
50	02 51	03 41	04 20	22 50	23 45	24 30	00 30
45	03 20	04 02	04 36	22 28	23 22	24 09	00 09
N 40	03 41	04 18	04 49	22 11	23 04	23 52	24 32
35	03 58	04 32	05 00	21 56	22 49	23 37	24 19
30	04 12	04 43	05 09	21 43	22 36	23 24	24 08
20	04 34	05 02	05 26	21 21	22 14	23 03	23 48
N 10	04 52	05 18	05 40	21 02	21 54	22 44	23 31
0	05 06	05 31	05 53	20 45	21 36	22 27	23 15
S 10	05 18	05 44	06 06	20 27	21 18	22 09	22 59
20	05 30	05 56	06 20	20 08	20 59	21 50	22 42
30	05 41	06 10	06 35	19 47	20 37	21 29	22 22
35	05 47	06 17	06 44	19 34	20 24	21 16	22 11
40	05 53	06 26	06 55	19 20	20 09	21 02	21 58
45	06 00	06 35	07 07	19 03	19 51	20 44	21 42
S 50	06 07	06 46	07 21	18 41	19 29	20 23	21 22
52	06 10	06 51	07 28	18 31	19 18	20 13	21 13
54	06 13	06 56	07 35	18 20	19 06	20 01	21 03
56	06 17	07 02	07 44	18 07	18 52	19 48	20 51
58	06 20	07 09	07 53	17 52	18 36	19 32	20 38
S 60	06 25	07 16	08 04	17 34	18 17	19 14	20 22

Lat.	Ocaso Sol	Crepúsculo Civil	Crepúsculo Náutico	Ocaso Luna 10	Ocaso Luna 11	Ocaso Luna 12	Ocaso Luna 13
°	h m	h m	h m	h m	h m	h m	h m
N 72	▭	▭	▭	▬	▬	▬	▬
N 70	22 38	////	////	▬	▬	▬	▬
68	21 48	////	////	02 46	▬	▬	▬
66	21 18	////	////	03 53	04 03	04 47	06 12
64	20 55	22 24	////	04 29	04 55	05 44	06 54
62	20 37	21 48	////	04 55	05 27	06 17	07 23
60	20 22	21 23	////	05 15	05 51	06 41	07 44
N 58	20 10	21 04	22 33	05 32	06 10	07 01	08 02
56	19 59	20 48	22 00	05 46	06 26	07 17	08 17
54	19 50	20 34	21 37	05 58	06 40	07 31	08 29
52	19 41	20 23	21 19	06 09	06 52	07 43	08 41
50	19 34	20 12	21 03	06 19	07 02	07 53	08 51
45	19 18	19 51	20 34	06 39	07 24	08 16	09 11
N 40	19 05	19 35	20 12	06 56	07 42	08 33	09 28
35	18 53	19 21	19 55	07 10	07 57	08 48	09 42
30	18 44	19 10	19 41	07 22	08 10	09 01	09 55
20	18 27	18 51	19 19	07 43	08 32	09 24	10 15
N 10	18 13	18 35	19 01	08 01	08 52	09 43	10 34
0	18 00	18 22	18 47	08 18	09 10	10 01	10 50
S 10	17 47	18 09	18 34	08 35	09 28	10 19	11 07
20	17 33	17 56	18 23	08 53	09 47	10 38	11 25
30	17 17	17 42	18 11	09 14	10 09	11 00	11 46
35	17 08	17 35	18 05	09 26	10 22	11 13	11 58
40	16 58	17 27	17 59	09 40	10 37	11 28	12 12
45	16 46	17 17	17 53	09 57	10 55	11 45	12 28
S 50	16 31	17 06	17 45	10 18	11 17	12 07	12 48
52	16 24	17 01	17 42	10 28	11 27	12 17	12 57
54	16 17	16 56	17 39	10 39	11 39	12 29	13 08
56	16 08	16 50	17 35	10 51	11 53	12 42	13 20
58	15 59	16 43	17 31	11 06	12 09	12 58	13 34
S 60	15 48	16 36	17 27	11 24	12 28	13 17	13 50

Día	SOL E. T. (+) 00h	SOL E. T. (+) 12h	SOL Pas. Mer.	LUNA Pas. Mer. Sup.	LUNA Pas. Mer. Inf.	LUNA Edad	LUNA Fase
d	m s	m s	h m	h m	h m	d	%
10	03 38	03 39	11 56	02 05	14 31	17	91
11	03 40	03 41	11 56	02 57	15 23	18	84
12	03 41	03 42	11 56	03 49	16 14	19	77

T.U.	ARIES	VENUS −4.5		MARTE −1.5		JUPITER −2.0		SATURNO +0.1	
d h	A.H.G.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.
	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
13 00	230 48.9	221 37.6	N 3 40.7	321 52.5	S24 46.0	155 52.1	N22 20.4	169 46.7	N19 01.8
01	245 51.4	236 38.4	41.1	336 55.0	46.1	170 54.0	20.5	184 48.8	01.8
02	260 53.9	251 39.2	41.4	351 57.5	46.2	185 55.8	20.5	199 50.9	01.9
03	275 56.3	266 40.0 . .	41.7	7 00.0 . .	46.4	200 57.7 . .	20.6	214 53.1 . .	02.0
04	290 58.8	281 40.9	42.1	22 02.5	46.5	215 59.6	20.7	229 55.2	02.0
05	306 01.3	296 41.7	42.4	37 05.1	46.7	231 01.5	20.7	244 57.3	02.1
06	321 03.7	311 42.5	N 3 42.8	52 07.6	S24 46.8	246 03.3	N22 20.8	259 59.5	N19 02.2
07	336 06.2	326 43.3	43.1	67 10.1	46.9	261 05.2	20.8	275 01.6	02.2
08	351 08.6	341 44.1	43.5	82 12.6	47.1	276 07.1	20.9	290 03.7	02.3
D 09	6 11.1	356 44.9 . .	43.8	97 15.1 . .	47.2	291 08.9 . .	21.0	305 05.9 . .	02.4
O 10	21 13.6	11 45.7	44.1	112 17.7	47.4	306 10.8	21.0	320 08.0	02.4
M 11	36 16.0	26 46.5	44.5	127 20.2	47.5	321 12.7	21.1	335 10.1	02.5
I 12	51 18.5	41 47.3	N 3 44.8	142 22.7	S24 47.6	336 14.5	N22 21.1	350 12.2	N19 02.6
N 13	66 21.0	56 48.1	45.2	157 25.2	47.8	351 16.4	21.2	5 14.4	02.6
G 14	81 23.4	71 48.9	45.5	172 27.8	47.9	6 18.3	21.3	20 16.5	02.7
O 15	96 25.9	86 49.7 . .	45.9	187 30.3 . .	48.1	21 20.1 . .	21.3	35 18.6 . .	02.8
16	111 28.4	101 50.5	46.2	202 32.8	48.2	36 22.0	21.4	50 20.8	02.8
17	126 30.8	116 51.3	46.6	217 35.4	48.3	51 23.9	21.5	65 22.9	02.9
18	141 33.3	131 52.1	N 3 47.0	232 37.9	S24 48.5	66 25.7	N22 21.5	80 25.0	N19 02.9
19	156 35.8	146 52.9	47.3	247 40.4	48.6	81 27.6	21.6	95 27.2	03.0
20	171 38.2	161 53.7	47.7	262 43.0	48.8	96 29.5	21.6	110 29.3	03.1
21	186 40.7	176 54.5 . .	48.0	277 45.5 . .	48.9	111 31.3 . .	21.7	125 31.4 . .	03.1
22	201 43.1	191 55.3	48.4	292 48.1	49.0	126 33.2	21.8	140 33.6	03.2
23	216 45.6	206 56.0	48.7	307 50.6	49.2	141 35.1	21.8	155 35.7	03.3
14 00	231 48.1	221 56.8	N 3 49.1	322 53.2	S24 49.3	156 36.9	N22 21.9	170 37.8	N19 03.3
01	246 50.5	236 57.6	49.5	337 55.7	49.5	171 38.8	21.9	185 40.0	03.4
02	261 53.0	251 58.4	49.8	352 58.2	49.6	186 40.7	22.0	200 42.1	03.5
03	276 55.5	266 59.2 . .	50.2	8 00.8 . .	49.8	201 42.5 . .	22.1	215 44.2 . .	03.5
04	291 57.9	281 59.9	50.6	23 03.3	49.9	216 44.4	22.1	230 46.4	03.6
05	307 00.4	297 00.7	50.9	38 05.9	50.0	231 46.3	22.2	245 48.5	03.7
06	322 02.9	312 01.5	N 3 51.3	53 08.5	S24 50.2	246 48.1	N22 22.3	260 50.6	N19 03.7
07	337 05.3	327 02.3	51.7	68 11.0	50.3	261 50.0	22.3	275 52.8	03.8
08	352 07.8	342 03.0	52.0	83 13.6	50.5	276 51.9	22.4	290 54.9	03.9
L 09	7 10.3	357 03.8 . .	52.4	98 16.1 . .	50.6	291 53.7 . .	22.4	305 57.0 . .	03.9
U 10	22 12.7	12 04.6	52.8	113 18.7	50.7	306 55.6	22.5	320 59.1	04.0
N 11	37 15.2	27 05.3	53.2	128 21.2	50.9	321 57.5	22.6	336 01.3	04.1
E 12	52 17.6	42 06.1	N 3 53.5	143 23.8	S24 51.0	336 59.3	N22 22.6	351 03.4	N19 04.1
S 13	67 20.1	57 06.9	53.9	158 26.4	51.2	352 01.2	22.7	6 05.5	04.2
14	82 22.6	72 07.6	54.3	173 28.9	51.3	7 03.1	22.7	21 07.7	04.3
15	97 25.0	87 08.4 . .	54.7	188 31.5 . .	51.5	22 04.9 . .	22.8	36 09.8 . .	04.3
16	112 27.5	102 09.1	55.0	203 34.1	51.6	37 06.8	22.9	51 11.9	04.4
17	127 30.0	117 09.9	55.4	218 36.6	51.7	52 08.7	22.9	66 14.1	04.4
18	142 32.4	132 10.7	N 3 55.8	233 39.2	S24 51.9	67 10.5	N22 23.0	81 16.2	N19 04.5
19	157 34.9	147 11.4	56.2	248 41.8	52.0	82 12.4	23.0	96 18.3	04.6
20	172 37.4	162 12.2	56.6	263 44.4	52.2	97 14.3	23.1	111 20.5	04.6
21	187 39.8	177 12.9 . .	56.9	278 46.9 . .	52.3	112 16.1 . .	23.2	126 22.6 . .	04.7
22	202 42.3	192 13.7	57.3	293 49.5	52.5	127 18.0	23.2	141 24.7	04.8
23	217 44.7	207 14.4	57.7	308 52.1	52.6	142 19.9	23.3	156 26.9	04.8
15 00	232 47.2	222 15.2	N 3 58.1	323 54.7	S24 52.7	157 21.7	N22 23.4	171 29.0	N19 04.9
01	247 49.7	237 15.9	58.5	338 57.2	52.9	172 23.6	23.4	186 31.1	05.0
02	262 52.1	252 16.6	58.9	353 59.8	53.0	187 25.5	23.5	201 33.3	05.0
03	277 54.6	267 17.4 . .	59.3	9 02.4 . .	53.2	202 27.3 . .	23.5	216 35.4 . .	05.1
04	292 57.1	282 18.1	3 59.7	24 05.0	53.3	217 29.2	23.6	231 37.5	05.2
05	307 59.5	297 18.9	4 00.1	39 07.6	53.5	232 31.1	23.7	246 39.6	05.2
06	323 02.0	312 19.6	N 4 00.4	54 10.2	S24 53.6	247 32.9	N22 23.7	261 41.8	N19 05.3
07	338 04.5	327 20.3	00.8	69 12.8	53.7	262 34.8	23.8	276 43.9	05.4
M 08	353 06.9	342 21.1	01.2	84 15.4	53.9	277 36.6	23.8	291 46.0	05.4
A 09	8 09.4	357 21.8 . .	01.6	99 17.9 . .	54.0	292 38.5 . .	23.9	306 48.2 . .	05.5
R 10	23 11.9	12 22.5	02.0	114 20.5	54.2	307 40.4	24.0	321 50.3	05.5
T 11	38 14.3	27 23.3	02.4	129 23.1	54.3	322 42.2	24.0	336 52.4	05.6
E 12	53 16.8	42 24.0	N 4 02.8	144 25.7	S24 54.5	337 44.1	N22 24.1	351 54.6	N19 05.7
S 13	68 19.2	57 24.7	03.2	159 28.3	54.6	352 46.0	24.1	6 56.7	05.7
14	83 21.7	72 25.4	03.6	174 30.9	54.7	7 47.8	24.2	21 58.8	05.8
15	98 24.2	87 26.2 . .	04.0	189 33.5 . .	54.9	22 49.7 . .	24.3	37 01.0 . .	05.9
16	113 26.6	102 26.9	04.4	204 36.1	55.0	37 51.6	24.3	52 03.1	05.9
17	128 29.1	117 27.6	04.8	219 38.7	55.2	52 53.4	24.4	67 05.2	06.0
18	143 31.6	132 28.3	N 4 05.2	234 41.3	S24 55.3	67 55.3	N22 24.4	82 07.3	N19 06.1
19	158 34.0	147 29.0	05.6	249 44.0	55.5	82 57.2	24.5	97 09.5	06.1
20	173 36.5	162 29.8	06.1	264 46.6	55.6	97 59.0	24.6	112 11.6	06.2
21	188 39.0	177 30.5 . .	06.5	279 49.2 . .	55.7	113 00.9 . .	24.6	127 13.7 . .	06.3
22	203 41.4	192 31.2	06.9	294 51.8	55.9	128 02.7	24.7	142 15.9	06.3
23	218 43.9	207 31.9	07.3	309 54.4	56.0	143 04.6	24.7	157 18.0	06.4
	h m								
Pas. Mer.	8 31.4	*v* 0.8	*d* 0.4	*v* 2.6	*d* 0.1	*v* 1.9	*d* 0.1	*v* 2.1	*d* 0.1

ESTRELLAS

Nombre	A.H.S.	Dec.
	° ′	° ′
Acamar	315 25.9	S40 18.1
Achernar	335 34.3	S57 13.8
Acrux	173 19.6	S63 06.5
Adhara	255 20.3	S28 58.6
Aldebaran	291 00.7	N16 30.6
Alioth	166 28.5	N55 57.4
Alkaid	153 05.9	N49 18.6
Al Na'ir	27 55.6	S46 57.2
Alnilam	275 56.3	S 1 12.2
Alphard	218 05.5	S 8 39.9
Alphecca	126 18.7	N26 42.6
Alpheratz	357 53.6	N29 05.6
Altair	62 17.3	N 8 52.2
Ankaa	353 25.3	S42 17.9
Antares	112 37.6	S26 26.1
Arcturus	146 04.1	N19 10.6
Atria	107 47.5	S69 01.7
Avior	234 22.2	S59 31.1
Bellatrix	278 42.5	N 6 20.9
Betelgeuse	271 11.9	N 7 24.3
Canopus	264 00.8	S52 42.0
Capella	280 49.0	N45 59.9
Deneb	49 37.9	N45 16.8
Denebola	182 43.2	N14 34.0
Diphda	349 05.7	S17 58.9
Dubhe	194 03.0	N61 45.0
Elnath	278 25.0	N28 36.5
Eltanin	90 50.1	N51 29.2
Enif	33 56.5	N 9 52.7
Fomalhaut	15 34.5	S29 36.9
Gacrux	172 11.2	S57 07.4
Gienah	176 01.9	S17 33.0
Hadar	149 00.9	S60 22.8
Hamal	328 11.9	N23 27.9
Kaus Aust.	83 56.1	S34 23.0
Kochab	137 18.3	N74 09.1
Markab	13 47.9	N15 12.5
Menkar	314 25.3	N 4 05.5
Menkent	148 18.5	S36 22.6
Miaplacidus	221 41.9	S69 43.6
Mirfak	308 54.6	N49 51.8
Nunki	76 09.8	S26 17.7
Peacock	53 33.9	S56 43.7
Pollux	243 39.5	N28 01.5
Procyon	245 09.9	N 5 13.3
Rasalhague	96 15.0	N12 33.5
Regulus	207 53.6	N11 57.7
Rigel	281 21.5	S 8 12.2
Rigil Kent.	140 04.3	S60 50.4
Sabik	102 23.1	S15 43.6
Schedar	349 51.9	N56 32.3
Shaula	96 34.5	S37 06.2
Sirius	258 42.4	S16 43.2
Spica	158 41.0	S11 10.1
Suhail	222 59.5	S43 26.5
Vega	80 45.1	N38 46.9
Zuben'ubi	137 15.6	S16 02.8

	A.H.S.	Pas. Mer.
	° ′	h m
Venus	350 08.7	9 12
Marte	91 05.1	2 28
Júpiter	284 48.9	13 32
Saturno	298 49.8	12 36

T.U.	SOL				LUNA						
	A.H.G.		Dec.		A.H.G.	v	Dec.		d	P.H.	
d h	°	′	°	′	°	′	°	′	′	′	
13 00	180	55.6	N18	20.6	292	38.7	11.1	S22	36.3	3.2	54.6
01	195	55.6		21.3	307	08.8	11.2	22	33.1	3.3	54.6
02	210	55.6		21.9	321	39.0	11.2	22	29.8	3.3	54.6
03	225	55.6	. .	22.5	336	09.2	11.2	22	26.5	3.5	54.6
04	240	55.6		23.1	350	39.4	11.3	22	23.0	3.6	54.6
05	255	55.6		23.7	5	09.7	11.3	22	19.4	3.7	54.5
06	270	55.6	N18	24.3	19	40.0	11.4	S22	15.7	3.8	54.5
07	285	55.6		25.0	34	10.4	11.4	22	11.9	3.9	54.5
D 08	300	55.6		25.6	48	40.8	11.4	22	08.0	4.0	54.5
O 09	315	55.6	. .	26.2	63	11.2	11.5	22	04.0	4.0	54.5
M 10	330	55.6		26.8	77	41.7	11.6	22	00.0	4.2	54.5
I 11	345	55.6		27.4	92	12.3	11.6	21	55.8	4.3	54.5
N 12	0	55.6	N18	28.0	106	42.9	11.6	S21	51.5	4.4	54.5
G 13	15	55.6		28.6	121	13.5	11.7	21	47.1	4.5	54.5
O 14	30	55.6		29.2	135	44.2	11.8	21	42.6	4.6	54.4
15	45	55.6	. .	29.9	150	15.0	11.7	21	38.0	4.7	54.4
16	60	55.6		30.5	164	45.7	11.9	21	33.3	4.8	54.4
17	75	55.6		31.1	179	16.6	11.9	21	28.5	4.9	54.4
18	90	55.6	N18	31.7	193	47.5	11.9	S21	23.6	5.0	54.4
19	105	55.6		32.3	208	18.4	12.0	21	18.6	5.0	54.4
20	120	55.6		32.9	222	49.4	12.0	21	13.6	5.2	54.4
21	135	55.6	. .	33.5	237	20.4	12.1	21	08.4	5.3	54.4
22	150	55.6		34.1	251	51.5	12.1	21	03.1	5.3	54.4
23	165	55.6		34.7	266	22.6	12.1	20	57.8	5.5	54.4
14 00	180	55.6	N18	35.3	280	53.7	12.3	S20	52.3	5.5	54.4
01	195	55.6		35.9	295	25.0	12.2	20	46.8	5.7	54.3
02	210	55.6		36.5	309	56.2	12.3	20	41.1	5.7	54.3
03	225	55.6	. .	37.1	324	27.5	12.4	20	35.4	5.8	54.3
04	240	55.6		37.7	338	58.9	12.4	20	29.6	5.9	54.3
05	255	55.6		38.3	353	30.3	12.5	20	23.7	6.0	54.3
06	270	55.6	N18	38.9	8	01.8	12.5	S20	17.7	6.1	54.3
07	285	55.6		39.6	22	33.3	12.5	20	11.6	6.2	54.3
08	300	55.6		40.2	37	04.8	12.6	20	05.4	6.3	54.3
L 09	315	55.6	. .	40.8	51	36.4	12.7	19	59.1	6.3	54.3
U 10	330	55.6		41.4	66	08.1	12.7	19	52.8	6.5	54.3
N 11	345	55.6		42.0	80	39.8	12.7	19	46.3	6.5	54.3
12	0	55.6	N18	42.6	95	11.5	12.8	S19	39.8	6.6	54.3
E 13	15	55.6		43.1	109	43.3	12.8	19	33.2	6.7	54.3
S 14	30	55.6		43.7	124	15.1	12.9	19	26.5	6.8	54.3
15	45	55.6	. .	44.3	138	47.0	13.0	19	19.7	6.9	54.3
16	60	55.6		44.9	153	19.0	12.9	19	12.8	6.9	54.3
17	75	55.6		45.5	167	50.9	13.1	19	05.9	7.1	54.3
18	90	55.6	N18	46.1	182	23.0	13.0	S18	58.8	7.1	54.3
19	105	55.6		46.7	196	55.0	13.2	18	51.7	7.2	54.3
20	120	55.6		47.3	211	27.2	13.1	18	44.5	7.3	54.3
21	135	55.6	. .	47.9	225	59.3	13.2	18	37.2	7.3	54.3
22	150	55.6		48.5	240	31.5	13.3	18	29.9	7.5	54.3
23	165	55.6		49.1	255	03.8	13.3	18	22.4	7.5	54.3
15 00	180	55.6	N18	49.7	269	36.1	13.3	S18	14.9	7.6	54.3
01	195	55.6		50.3	284	08.4	13.4	18	07.3	7.6	54.3
02	210	55.6		50.9	298	40.8	13.4	17	59.7	7.8	54.3
03	225	55.6	. .	51.5	313	13.2	13.5	17	51.9	7.8	54.3
04	240	55.6		52.1	327	45.7	13.5	17	44.1	7.9	54.3
05	255	55.6		52.7	342	18.2	13.6	17	36.2	8.0	54.3
06	270	55.6	N18	53.2	356	50.8	13.6	S17	28.2	8.0	54.3
07	285	55.5		53.8	11	23.4	13.6	17	20.2	8.2	54.3
M 08	300	55.5		54.4	25	56.0	13.7	17	12.0	8.2	54.3
A 09	315	55.5	. .	55.0	40	28.7	13.8	17	03.8	8.2	54.3
R 10	330	55.5		55.6	55	01.5	13.7	16	55.6	8.4	54.3
11	345	55.5		56.2	69	34.2	13.8	16	47.2	8.4	54.3
T 12	0	55.5	N18	56.8	84	07.0	13.9	S16	38.8	8.5	54.3
13	15	55.5		57.4	98	39.9	13.9	16	30.3	8.6	54.3
E 14	30	55.5		57.9	113	12.8	13.9	16	21.7	8.6	54.3
S 15	45	55.5	. .	58.5	127	45.7	14.0	16	13.1	8.7	54.3
16	60	55.5		59.1	142	18.7	14.0	16	04.4	8.7	54.3
17	75	55.5	18	59.7	156	51.7	14.0	15	55.7	8.9	54.3
18	90	55.5	N19	00.3	171	24.7	14.1	S15	46.8	8.9	54.3
19	105	55.4		00.9	185	57.8	14.1	15	37.9	9.0	54.3
20	120	55.4		01.4	200	30.9	14.2	15	28.9	9.0	54.3
21	135	55.4	. .	02.0	215	04.1	14.2	15	19.9	9.1	54.3
22	150	55.4		02.6	229	37.3	14.2	15	10.8	9.2	54.3
23	165	55.4		03.2	244	10.5	14.3	S15	01.6	9.2	54.3
	SD	15.8	d	0.6	SD		14.8		14.8		14.8

Lat.	Crepúsculo Náutico	Crepúsculo Civil	Orto Sol	Orto Luna 13	Orto Luna 14	Orto Luna 15	Orto Luna 16
°	h m	h m	h m	h m	h m	h m	h m
N 72	▭	▭	▭	▬	▬	05 24	04 19
N 70	////	////	00 53	▬	▬	04 17	03 51
68	////	////	01 52	▬	03 58	03 40	03 29
66	////	////	02 26	03 10	03 14	03 14	03 12
64	////	01 15	02 50	02 28	02 45	02 54	02 59
62	////	01 55	03 09	01 59	02 23	02 37	02 47
60	////	02 22	03 25	01 37	02 05	02 23	02 37
N 58	01 07	02 43	03 38	01 20	01 50	02 12	02 28
56	01 44	03 00	03 49	01 04	01 37	02 01	02 20
54	02 09	03 14	03 59	00 51	01 26	01 52	02 13
52	02 29	03 26	04 08	00 40	01 16	01 44	02 07
50	02 44	03 36	04 16	00 30	01 07	01 37	02 01
45	03 15	03 58	04 32	00 09	00 48	01 21	01 49
N 40	03 38	04 15	04 46	24 32	00 32	01 08	01 39
35	03 55	04 29	04 57	24 19	00 19	00 57	01 30
30	04 10	04 41	05 07	24 08	00 08	00 47	01 23
20	04 33	05 01	05 24	23 48	24 30	00 30	01 09
N 10	04 51	05 17	05 39	23 31	24 16	00 16	00 58
0	05 06	05 31	05 53	23 15	24 02	00 02	00 47
S 10	05 19	05 44	06 06	22 59	23 48	24 36	00 36
20	05 31	05 58	06 21	22 42	23 34	24 24	00 24
30	05 43	06 12	06 37	22 22	23 17	24 11	00 11
35	05 49	06 20	06 47	22 11	23 07	24 03	00 03
40	05 56	06 28	06 57	21 58	22 55	23 54	24 53
45	06 03	06 38	07 10	21 42	22 42	23 43	24 45
S 50	06 10	06 50	07 25	21 22	22 26	23 31	24 37
52	06 14	06 55	07 32	21 13	22 18	23 25	24 32
54	06 17	07 01	07 40	21 03	22 09	23 18	24 28
56	06 21	07 07	07 49	20 51	22 00	23 11	24 23
58	06 25	07 14	07 59	20 38	21 49	23 02	24 17
S 60	06 30	07 22	08 11	20 22	21 36	22 53	24 11

Lat.	Ocaso Sol	Crepúsculo Civil	Crepúsculo Náutico	Ocaso Luna 13	Ocaso Luna 14	Ocaso Luna 15	Ocaso Luna 16
°	h m	h m	h m	h m	h m	h m	h m
N 72	▭	▭	▭	▬	▬	07 17	09 54
N 70	23 12	////	////	▬	▬	08 23	10 21
68	22 05	////	////	▬	07 05	08 59	10 41
66	21 30	////	////	06 12	07 48	09 24	10 57
64	21 05	22 44	////	06 54	08 17	09 43	11 10
62	20 45	22 01	////	07 23	08 39	09 59	11 21
60	20 30	21 33	////	07 44	08 56	10 12	11 30
N 58	20 16	21 12	22 51	08 02	09 11	10 24	11 38
56	20 05	20 55	22 12	08 17	09 23	10 33	11 45
54	19 55	20 40	21 46	08 29	09 34	10 42	11 51
52	19 46	20 28	21 26	08 41	09 44	10 50	11 57
50	19 38	20 17	21 10	08 51	09 52	10 57	12 02
45	19 21	19 55	20 39	09 11	10 11	11 11	12 13
N 40	19 07	19 38	20 16	09 28	10 25	11 23	12 22
35	18 56	19 24	19 58	09 42	10 38	11 34	12 30
30	18 46	19 12	19 43	09 55	10 49	11 43	12 37
20	18 28	18 52	19 20	10 15	11 07	11 58	12 48
N 10	18 14	18 36	19 02	10 34	11 23	12 11	12 58
0	18 00	18 22	18 47	10 50	11 38	12 24	13 08
S 10	17 46	18 08	18 34	11 07	11 53	12 36	13 17
20	17 32	17 55	18 22	11 25	12 09	12 49	13 27
30	17 15	17 41	18 09	11 46	12 27	13 04	13 39
35	17 06	17 33	18 03	11 58	12 38	13 13	13 45
40	16 55	17 24	17 57	12 12	12 50	13 23	13 52
45	16 42	17 14	17 50	12 28	13 04	13 34	14 01
S 50	16 27	17 02	17 42	12 48	13 21	13 48	14 11
52	16 20	16 57	17 38	12 57	13 29	13 55	14 16
54	16 12	16 51	17 35	13 08	13 38	14 02	14 21
56	16 03	16 45	17 31	13 20	13 48	14 10	14 27
58	15 53	16 38	17 27	13 34	14 00	14 19	14 33
S 60	15 41	16 30	17 22	13 50	14 13	14 29	14 40

Día	SOL E.T. (+) 00h	SOL E.T. (+) 12h	SOL Pas. Mer.	LUNA Pas. Mer. Sup.	LUNA Mer. Inf.	LUNA Edad	LUNA Fase
d	m s	m s	h m	h m	h m	d	%
13	03 42	03 42	11 56	04 39	17 03	20	68
14	03 43	03 43	11 56	05 27	17 50	21	59
15	03 42	03 42	11 56	06 13	18 35	22	49

T.U.	ARIES	VENUS −4.5		MARTE −1.6		JUPITER −1.9		SATURNO +0.1	
	A.H.G.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
16 00	233 46.4	222 32.6	N 4 07.7	324 57.0	S24 56.2	158 06.5	N22 24.8	172 20.1	N19 06.5
01	248 48.8	237 33.3	08.1	339 59.6	56.3	173 08.3	24.9	187 22.3	06.5
02	263 51.3	252 34.0	08.5	355 02.2	56.5	188 10.2	24.9	202 24.4	06.6
03	278 53.7	267 34.7 . .	08.9	10 04.9 . .	56.6	203 12.1 . .	25.0	217 26.5 . .	06.6
04	293 56.2	282 35.4	09.4	25 07.5	56.8	218 13.9	25.0	232 28.7	06.7
05	308 58.7	297 36.1	09.8	40 10.1	56.9	233 15.8	25.1	247 30.8	06.8
06	324 01.1	312 36.9	N 4 10.2	55 12.7	S24 57.0	248 17.7	N22 25.2	262 32.9	N19 06.8
M 07	339 03.6	327 37.6	10.6	70 15.4	57.2	263 19.5	25.2	277 35.0	06.9
I 08	354 06.1	342 38.3	11.0	85 18.0	57.3	278 21.4	25.3	292 37.2	07.0
E 09	9 08.5	357 38.9 . .	11.4	100 20.6 . .	57.5	293 23.2 . .	25.3	307 39.3 . .	07.0
R 10	24 11.0	12 39.6	11.9	115 23.2	57.6	308 25.1	25.4	322 41.4	07.1
C 11	39 13.5	27 40.3	12.3	130 25.9	57.8	323 27.0	25.5	337 43.6	07.2
O 12	54 15.9	42 41.0	N 4 12.7	145 28.5	S24 57.9	338 28.8	N22 25.5	352 45.7	N19 07.2
L 13	69 18.4	57 41.7	13.1	160 31.1	58.1	353 30.7	25.6	7 47.8	07.3
E 14	84 20.8	72 42.4	13.6	175 33.8	58.2	8 32.6	25.6	22 50.0	07.4
S 15	99 23.3	87 43.1 . .	14.0	190 36.4 . .	58.3	23 34.4 . .	25.7	37 52.1 . .	07.4
16	114 25.8	102 43.8	14.4	205 39.1	58.5	38 36.3	25.7	52 54.2	07.5
17	129 28.2	117 44.5	14.8	220 41.7	58.6	53 38.1	25.8	67 56.3	07.5
18	144 30.7	132 45.2	N 4 15.3	235 44.3	S24 58.8	68 40.0	N22 25.9	82 58.5	N19 07.6
19	159 33.2	147 45.9	15.7	250 47.0	58.9	83 41.9	25.9	98 00.6	07.7
20	174 35.6	162 46.5	16.1	265 49.6	59.1	98 43.7	26.0	113 02.7	07.7
21	189 38.1	177 47.2 . .	16.6	280 52.3 . .	59.2	113 45.6 . .	26.0	128 04.9 . .	07.8
22	204 40.6	192 47.9	17.0	295 54.9	59.4	128 47.5	26.1	143 07.0	07.9
23	219 43.0	207 48.6	17.4	310 57.6	59.5	143 49.3	26.2	158 09.1	07.9
17 00	234 45.5	222 49.3	N 4 17.9	326 00.2	S24 59.7	158 51.2	N22 26.2	173 11.3	N19 08.0
01	249 48.0	237 49.9	18.3	341 02.9	59.8	173 53.0	26.3	188 13.4	08.1
02	264 50.4	252 50.6	18.7	356 05.5	24 59.9	188 54.9	26.3	203 15.5	08.1
03	279 52.9	267 51.3 . .	19.2	11 08.2	25 00.1	203 56.8 . .	26.4	218 17.6 . .	08.2
04	294 55.3	282 51.9	19.6	26 10.8	00.2	218 58.6	26.5	233 19.8	08.3
05	309 57.8	297 52.6	20.0	41 13.5	00.4	234 00.5	26.5	248 21.9	08.3
06	325 00.3	312 53.3	N 4 20.5	56 16.1	S25 00.5	249 02.4	N22 26.6	263 24.0	N19 08.4
07	340 02.7	327 54.0	20.9	71 18.8	00.7	264 04.2	26.6	278 26.2	08.4
J 08	355 05.2	342 54.6	21.4	86 21.5	00.8	279 06.1	26.7	293 28.3	08.5
U 09	10 07.7	357 55.3 . .	21.8	101 24.1 . .	01.0	294 07.9 . .	26.8	308 30.4 . .	08.6
E 10	25 10.1	12 55.9	22.3	116 26.8	01.1	309 09.8	26.8	323 32.6	08.6
V 11	40 12.6	27 56.6	22.7	131 29.5	01.3	324 11.7	26.9	338 34.7	08.7
E 12	55 15.1	42 57.3	N 4 23.1	146 32.1	S25 01.4	339 13.5	N22 26.9	353 36.8	N19 08.8
S 13	70 17.5	57 57.9	23.6	161 34.8	01.6	354 15.4	27.0	8 38.9	08.8
14	85 20.0	72 58.6	24.0	176 37.5	01.7	9 17.2	27.0	23 41.1	08.9
15	100 22.5	87 59.2 . .	24.5	191 40.1 . .	01.8	24 19.1 . .	27.1	38 43.2 . .	09.0
16	115 24.9	102 59.9	24.9	206 42.8	02.0	39 21.0	27.2	53 45.3	09.0
17	130 27.4	118 00.6	25.4	221 45.5	02.1	54 22.8	27.2	68 47.5	09.1
18	145 29.8	133 01.2	N 4 25.8	236 48.2	S25 02.3	69 24.7	N22 27.3	83 49.6	N19 09.2
19	160 32.3	148 01.9	26.3	251 50.8	02.4	84 26.5	27.3	98 51.7	09.2
20	175 34.8	163 02.5	26.7	266 53.5	02.6	99 28.4	27.4	113 53.8	09.3
21	190 37.2	178 03.2 . .	27.2	281 56.2 . .	02.7	114 30.3 . .	27.5	128 56.0 . .	09.3
22	205 39.7	193 03.8	27.6	296 58.9	02.9	129 32.1	27.5	143 58.1	09.4
23	220 42.2	208 04.4	28.1	312 01.6	03.0	144 34.0	27.6	159 00.2	09.5
18 00	235 44.6	223 05.1	N 4 28.6	327 04.3	S25 03.2	159 35.8	N22 27.6	174 02.4	N19 09.5
01	250 47.1	238 05.7	29.0	342 06.9	03.3	174 37.7	27.7	189 04.5	09.6
02	265 49.6	253 06.4	29.5	357 09.6	03.5	189 39.6	27.7	204 06.6	09.7
03	280 52.0	268 07.0 . .	29.9	12 12.3 . .	03.6	204 41.4 . .	27.8	219 08.8 . .	09.7
04	295 54.5	283 07.7	30.4	27 15.0	03.8	219 43.3	27.9	234 10.9	09.8
05	310 56.9	298 08.3	30.9	42 17.7	03.9	234 45.1	27.9	249 13.0	09.9
06	325 59.4	313 08.9	N 4 31.3	57 20.4	S25 04.0	249 47.0	N22 28.0	264 15.1	N19 09.9
07	341 01.9	328 09.6	31.8	72 23.1	04.2	264 48.9	28.0	279 17.3	10.0
V 08	356 04.3	343 10.2	32.2	87 25.8	04.3	279 50.7	28.1	294 19.4	10.0
I 09	11 06.8	358 10.8 . .	32.7	102 28.5 . .	04.5	294 52.6 . .	28.2	309 21.5 . .	10.1
E 10	26 09.3	13 11.5	33.2	117 31.2	04.6	309 54.4	28.2	324 23.7	10.2
R 11	41 11.7	28 12.1	33.6	132 33.9	04.8	324 56.3	28.3	339 25.8	10.2
N 12	56 14.2	43 12.7	N 4 34.1	147 36.6	S25 04.9	339 58.2	N22 28.3	354 27.9	N19 10.3
E 13	71 16.7	58 13.4	34.6	162 39.3	05.1	355 00.0	28.4	9 30.0	10.4
S 14	86 19.1	73 14.0	35.0	177 42.0	05.2	10 01.9	28.4	24 32.2	10.4
15	101 21.6	88 14.6 . .	35.5	192 44.7 . .	05.4	25 03.7 . .	28.5	39 34.3 . .	10.5
16	116 24.1	103 15.2	36.0	207 47.4	05.5	40 05.6	28.6	54 36.4	10.6
17	131 26.5	118 15.8	36.5	222 50.1	05.7	55 07.5	28.6	69 38.6	10.6
18	146 29.0	133 16.5	N 4 36.9	237 52.9	S25 05.8	70 09.3	N22 28.7	84 40.7	N19 10.7
19	161 31.4	148 17.1	37.4	252 55.6	06.0	85 11.2	28.7	99 42.8	10.7
20	176 33.9	163 17.7	37.9	267 58.3	06.1	100 13.0	28.8	114 45.0	10.8
21	191 36.4	178 18.3 . .	38.4	283 01.0 . .	06.3	115 14.9 . .	28.8	129 47.1 . .	10.9
22	206 38.8	193 18.9	38.8	298 03.7	06.4	130 16.8	28.9	144 49.2	10.9
23	221 41.3	208 19.6	39.3	313 06.4	06.6	145 18.6	29.0	159 51.3	11.0
Pas. Mer.	h m 8 19.6	*v* 0.7	*d* 0.4	*v* 2.7	*d* 0.1	*v* 1.9	*d* 0.1	*v* 2.1	*d* 0.1

ESTRELLAS

Nombre	A.H.S.	Dec.
	° ′	° ′
Acamar	315 25.9	S40 18.1
Achernar	335 34.3	S57 13.8
Acrux	173 19.6	S63 06.6
Adhara	255 20.3	S28 58.6
Aldebaran	291 00.7	N16 30.6
Alioth	166 28.5	N55 57.4
Alkaid	153 05.9	N49 18.6
Al Na'ir	27 55.6	S46 57.2
Alnilam	275 56.3	S 1 12.2
Alphard	218 05.5	S 8 39.9
Alphecca	126 18.7	N26 42.6
Alpheratz	357 53.6	N29 05.6
Altair	62 17.3	N 8 52.2
Ankaa	353 25.3	S42 17.9
Antares	112 37.6	S26 26.1
Arcturus	146 04.1	N19 10.6
Atria	107 47.5	S69 01.7
Avior	234 22.2	S59 31.1
Bellatrix	278 42.5	N 6 20.9
Betelgeuse	271 11.9	N 7 24.4
Canopus	264 00.8	S52 42.0
Capella	280 49.0	N45 59.9
Deneb	49 37.8	N45 16.8
Denebola	182 43.2	N14 34.0
Diphda	349 05.6	S17 58.9
Dubhe	194 03.0	N61 45.0
Elnath	278 25.0	N28 36.5
Eltanin	90 50.1	N51 29.2
Enif	33 56.4	N 9 52.7
Fomalhaut	15 34.5	S29 36.9
Gacrux	172 11.2	S57 07.4
Gienah	176 01.9	S17 33.0
Hadar	149 00.9	S60 22.8
Hamal	328 11.9	N23 27.9
Kaus Aust.	83 56.1	S34 23.0
Kochab	137 18.3	N74 09.2
Markab	13 47.9	N15 12.5
Menkar	314 25.3	N 4 05.5
Menkent	148 18.5	S36 22.6
Miaplacidus	221 42.0	S69 43.6
Mirfak	308 54.6	N49 51.8
Nunki	76 09.8	S26 17.7
Peacock	53 33.9	S56 43.7
Pollux	243 39.5	N28 01.5
Procyon	245 09.9	N 5 13.3
Rasalhague	96 15.0	N12 33.5
Regulus	207 53.6	N11 57.7
Rigel	281 21.5	S 8 12.1
Rigil Kent.	140 04.3	S60 50.5
Sabik	102 23.1	S15 43.6
Schedar	349 51.9	N56 32.3
Shaula	96 34.5	S37 06.2
Sirius	258 42.4	S16 43.2
Spica	158 41.0	S11 10.1
Suhail	222 59.6	S43 26.5
Vega	80 45.1	N38 46.9
Zuben'ubi	137 15.6	S16 02.8

	A.H.S.	Pas. Mer.
	° ′	h m
Venus	348 03.8	9 08
Marte	91 14.7	2 16
Júpiter	284 05.7	13 23
Saturno	298 25.8	12 25

T.U.	SOL				LUNA					
	A.H.G.		Dec.		A.H.G.	v	Dec.	d	P.H.	
d h	°	′	°	′	°	′	°	′	′	′
16 00	180	55.4	N19	03.8	258	43.8	14.3	S14	52.4	9.3	54.3
01	195	55.4		04.3	273	17.1	14.3	14	43.1	9.3	54.3
02	210	55.4		04.9	287	50.4	14.3	14	33.8	9.5	54.3
03	225	55.4	. .	05.5	302	23.7	14.4	14	24.3	9.4	54.4
04	240	55.3		06.1	316	57.1	14.5	14	14.9	9.6	54.4
05	255	55.3		06.6	331	30.6	14.4	14	05.3	9.6	54.4
06	270	55.3	N19	07.2	346	04.0	14.5	S13	55.7	9.7	54.4
M 07	285	55.3		07.8	0	37.5	14.5	13	46.0	9.7	54.4
I 08	300	55.3		08.4	15	11.0	14.6	13	36.3	9.8	54.4
E 09	315	55.3	. .	08.9	29	44.6	14.5	13	26.5	9.8	54.4
R 10	330	55.3		09.5	44	18.1	14.6	13	16.7	9.9	54.4
C 11	345	55.2		10.1	58	51.7	14.7	13	06.8	10.0	54.4
O 12	0	55.2	N19	10.7	73	25.4	14.6	S12	56.8	10.0	54.4
L 13	15	55.2		11.2	87	59.0	14.7	12	46.8	10.1	54.4
E 14	30	55.2		11.8	102	32.7	14.7	12	36.7	10.1	54.5
S 15	45	55.2	. .	12.4	117	06.4	14.7	12	26.6	10.2	54.5
16	60	55.2		12.9	131	40.1	14.8	12	16.4	10.2	54.5
17	75	55.2		13.5	146	13.9	14.8	12	06.2	10.3	54.5
18	90	55.1	N19	14.1	160	47.7	14.8	S11	55.9	10.4	54.5
19	105	55.1		14.7	175	21.5	14.8	11	45.5	10.4	54.5
20	120	55.1		15.2	189	55.3	14.8	11	35.1	10.4	54.5
21	135	55.1	. .	15.8	204	29.1	14.9	11	24.7	10.5	54.5
22	150	55.1		16.4	219	03.0	14.9	11	14.2	10.6	54.6
23	165	55.1		16.9	233	36.9	14.9	11	03.6	10.6	54.6
17 00	180	55.0	N19	17.5	248	10.8	14.9	S10	53.0	10.6	54.6
01	195	55.0		18.1	262	44.7	14.9	10	42.4	10.7	54.6
02	210	55.0		18.6	277	18.6	15.0	10	31.7	10.8	54.6
03	225	55.0	. .	19.2	291	52.6	15.0	10	20.9	10.8	54.6
04	240	55.0		19.7	306	26.6	15.0	10	10.1	10.8	54.6
05	255	55.0		20.3	321	00.6	15.0	9	59.3	10.9	54.7
06	270	54.9	N19	20.9	335	34.6	15.0	S 9	48.4	11.0	54.7
07	285	54.9		21.4	350	08.6	15.0	9	37.4	11.0	54.7
J 08	300	54.9		22.0	4	42.6	15.0	9	26.4	11.0	54.7
U 09	315	54.9	. .	22.6	19	16.6	15.1	9	15.4	11.1	54.7
E 10	330	54.9		23.1	33	50.7	15.1	9	04.3	11.1	54.7
V 11	345	54.8		23.7	48	24.8	15.0	8	53.2	11.2	54.7
E 12	0	54.8	N19	24.2	62	58.8	15.1	S 8	42.0	11.2	54.8
S 13	15	54.8		24.8	77	32.9	15.1	8	30.8	11.2	54.8
14	30	54.8		25.3	92	07.0	15.1	8	19.6	11.3	54.8
15	45	54.8	. .	25.9	106	41.1	15.1	8	08.3	11.3	54.8
16	60	54.7		26.5	121	15.2	15.1	7	57.0	11.4	54.8
17	75	54.7		27.0	135	49.3	15.1	7	45.6	11.4	54.9
18	90	54.7	N19	27.6	150	23.4	15.1	S 7	34.2	11.5	54.9
19	105	54.7		28.1	164	57.5	15.2	7	22.7	11.5	54.9
20	120	54.6		28.7	179	31.7	15.1	7	11.2	11.5	54.9
21	135	54.6	. .	29.2	194	05.8	15.1	6	59.7	11.5	54.9
22	150	54.6		29.8	208	39.9	15.2	6	48.2	11.6	54.9
23	165	54.6		30.3	223	14.1	15.1	6	36.6	11.7	55.0
18 00	180	54.5	N19	30.9	237	48.2	15.1	S 6	24.9	11.7	55.0
01	195	54.5		31.4	252	22.3	15.1	6	13.2	11.7	55.0
02	210	54.5		32.0	266	56.4	15.2	6	01.5	11.7	55.0
03	225	54.5	. .	32.5	281	30.6	15.1	5	49.8	11.8	55.0
04	240	54.5		33.1	296	04.7	15.1	5	38.0	11.8	55.1
05	255	54.4		33.6	310	38.8	15.1	5	26.2	11.8	55.1
06	270	54.4	N19	34.2	325	12.9	15.1	S 5	14.4	11.9	55.1
07	285	54.4		34.7	339	47.0	15.1	5	02.5	11.9	55.1
V 08	300	54.4		35.3	354	21.1	15.1	4	50.6	11.9	55.1
I 09	315	54.3	. .	35.8	8	55.2	15.1	4	38.7	12.0	55.2
E 10	330	54.3		36.4	23	29.3	15.0	4	26.7	12.0	55.2
R 11	345	54.3		36.9	38	03.3	15.1	4	14.7	12.0	55.2
N 12	0	54.2	N19	37.5	52	37.4	15.1	S 4	02.7	12.0	55.2
E 13	15	54.2		38.0	67	11.5	15.0	3	50.7	12.1	55.3
S 14	30	54.2		38.6	81	45.5	15.0	3	38.6	12.1	55.3
15	45	54.2	. .	39.1	96	19.5	15.0	3	26.5	12.1	55.3
16	60	54.1		39.6	110	53.5	15.0	3	14.4	12.2	55.3
17	75	54.1		40.2	125	27.5	15.0	3	02.2	12.1	55.4
18	90	54.1	N19	40.7	140	01.5	15.0	S 2	50.1	12.2	55.4
19	105	54.1		41.3	154	35.5	14.9	2	37.9	12.2	55.4
20	120	54.0		41.8	169	09.4	14.9	2	25.7	12.3	55.4
21	135	54.0	. .	42.4	183	43.3	15.0	2	13.4	12.2	55.4
22	150	54.0		42.9	198	17.3	14.8	2	01.2	12.3	55.5
23	165	53.9		43.4	212	51.1	14.9	S 1	48.9	12.3	55.5
	SD	15.8	d	0.6	SD		14.8		14.9		15.1

Lat.	Crepúsculo Náutico	Crepúsculo Civil	Orto Sol	Orto Luna 16	Orto Luna 17	Orto Luna 18	Orto Luna 19
°	h m	h m	h m	h m	h m	h m	h m
N 72	▭	▭	▭	04 19	03 50	03 28	03 09
N 70	▭	▭	▭	03 51	03 34	03 20	03 08
68	////	////	01 35	03 29	03 21	03 14	03 07
66	////	////	02 14	03 12	03 10	03 08	03 06
64	////	00 52	02 41	02 59	03 01	03 03	03 05
62	////	01 42	03 01	02 47	02 54	02 59	03 04
60	////	02 13	03 18	02 37	02 47	02 55	03 03
N 58	00 47	02 35	03 32	02 28	02 41	02 52	03 03
56	01 32	02 53	03 44	02 20	02 36	02 49	03 02
54	02 00	03 08	03 54	02 13	02 31	02 47	03 02
52	02 21	03 21	04 03	02 07	02 27	02 44	03 01
50	02 38	03 32	04 11	02 01	02 23	02 42	03 01
45	03 10	03 54	04 29	01 49	02 14	02 38	03 00
N 40	03 34	04 12	04 43	01 39	02 07	02 34	02 59
35	03 52	04 27	04 55	01 30	02 01	02 30	02 59
30	04 08	04 39	05 05	01 23	01 56	02 27	02 58
20	04 31	04 59	05 23	01 09	01 46	02 22	02 57
N 10	04 50	05 16	05 39	00 58	01 38	02 17	02 57
0	05 05	05 31	05 53	00 47	01 30	02 13	02 56
S 10	05 19	05 45	06 07	00 36	01 22	02 09	02 55
20	05 32	05 59	06 22	00 24	01 14	02 04	02 54
30	05 44	06 14	06 39	00 11	01 05	01 59	02 54
35	05 51	06 22	06 49	00 03	00 59	01 56	02 53
40	05 58	06 31	07 00	24 53	00 53	01 52	02 52
45	06 05	06 41	07 13	24 45	00 45	01 48	02 52
S 50	06 14	06 53	07 29	24 37	00 37	01 43	02 51
52	06 17	06 59	07 37	24 32	00 32	01 41	02 51
54	06 21	07 05	07 45	24 28	00 28	01 39	02 50
56	06 25	07 12	07 55	24 23	00 23	01 36	02 50
58	06 30	07 19	08 05	24 17	00 17	01 33	02 49
S 60	06 35	07 27	08 18	24 11	00 11	01 29	02 49

Lat.	Ocaso Sol	Crepúsculo Civil	Crepúsculo Náutico	Ocaso Luna 16	Ocaso Luna 17	Ocaso Luna 18	Ocaso Luna 19
°	h m	h m	h m	h m	h m	h m	h m
N 72	▭	▭	▭	09 54	11 54	13 45	15 36
N 70	▭	▭	▭	10 21	12 08	13 51	15 34
68	22 23	////	////	10 41	12 19	13 55	15 32
66	21 42	////	////	10 57	12 28	13 59	15 31
64	21 15	23 10	////	11 10	12 36	14 02	15 30
62	20 54	22 14	////	11 21	12 43	14 05	15 29
60	20 37	21 43	////	11 30	12 48	14 07	15 28
N 58	20 22	21 20	23 14	11 38	12 53	14 09	15 27
56	20 10	21 02	22 24	11 45	12 58	14 11	15 26
54	20 00	20 46	21 55	11 51	13 02	14 13	15 25
52	19 51	20 33	21 33	11 57	13 05	14 14	15 25
50	19 42	20 22	21 16	12 02	13 08	14 16	15 24
45	19 25	19 59	20 43	12 13	13 15	14 19	15 23
N 40	19 10	19 41	20 19	12 22	13 21	14 21	15 22
35	18 58	19 26	20 01	12 30	13 26	14 23	15 21
30	18 48	19 14	19 46	12 37	13 31	14 25	15 20
20	18 30	18 53	19 22	12 48	13 38	14 28	15 19
N 10	18 14	18 37	19 03	12 58	13 45	14 31	15 18
0	18 00	18 22	18 47	13 08	13 51	14 34	15 17
S 10	17 46	18 08	18 34	13 17	13 57	14 36	15 16
20	17 31	17 54	18 21	13 27	14 03	14 39	15 14
30	17 13	17 39	18 08	13 39	14 11	14 42	15 13
35	17 04	17 31	18 01	13 45	14 15	14 44	15 12
40	16 52	17 21	17 54	13 52	14 20	14 45	15 11
45	16 39	17 11	17 47	14 01	14 25	14 48	15 10
S 50	16 23	16 59	17 38	14 11	14 32	14 50	15 09
52	16 15	16 53	17 35	14 16	14 34	14 52	15 08
54	16 07	16 47	17 31	14 21	14 38	14 53	15 08
56	15 57	16 40	17 27	14 27	14 41	14 54	15 07
58	15 47	16 33	17 22	14 33	14 45	14 56	15 06
S 60	15 34	16 25	17 17	14 40	14 50	14 58	15 05

Día	SOL E.T. (+) 00h	SOL E.T. (+) 12h	SOL Pas. Mer.	LUNA Pas. Sup.	LUNA Mer. Inf.	LUNA Edad	LUNA Fase
d	m s	m s	h m	h m	h m	d %	
16	03 42	03 41	11 56	06 57	19 19	23 40	
17	03 40	03 39	11 56	07 41	20 02	24 31	(
18	03 38	03 37	11 56	08 23	20 45	25 22	

T.U.	ARIES	VENUS −4.4		MARTE −1.7		JUPITER −1.9		SATURNO +0.1	
d h	A.H.G.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.
	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
19 00	236 43.8	223 20.2	N 4 39.8	328 09.2	S25 06.7	160 20.5	N22 29.0	174 53.5	N19 11.1
01	251 46.2	238 20.8	40.3	343 11.9	06.9	175 22.3	29.1	189 55.6	11.1
02	266 48.7	253 21.4	40.7	358 14.6	07.0	190 24.2	29.1	204 57.7	11.2
03	281 51.2	268 22.0 . .	41.2	13 17.3 . .	07.1	205 26.1 . .	29.2	219 59.9 . .	11.3
04	296 53.6	283 22.6	41.7	28 20.1	07.3	220 27.9	29.2	235 02.0	11.3
05	311 56.1	298 23.2	42.2	43 22.8	07.4	235 29.8	29.3	250 04.1	11.4
06	326 58.5	313 23.8	N 4 42.7	58 25.5	S25 07.6	250 31.6	N22 29.4	265 06.2	N19 11.4
07	342 01.0	328 24.4	43.2	73 28.3	07.7	265 33.5	29.4	280 08.4	11.5
S 08	357 03.5	343 25.0	43.6	88 31.0	07.9	280 35.3	29.5	295 10.5	11.6
A 09	12 05.9	358 25.6 . .	44.1	103 33.7 . .	08.0	295 37.2 . .	29.5	310 12.6 . .	11.6
10	27 08.4	13 26.2	44.6	118 36.5	08.2	310 39.1	29.6	325 14.8	11.7
B 11	42 10.9	28 26.8	45.1	133 39.2	08.3	325 40.9	29.6	340 16.9	11.8
12	57 13.3	43 27.4	N 4 45.6	148 41.9	S25 08.5	340 42.8	N22 29.7	355 19.0	N19 11.8
A 13	72 15.8	58 28.0	46.1	163 44.7	08.6	355 44.6	29.8	10 21.1	11.9
D 14	87 18.3	73 28.6	46.6	178 47.4	08.8	10 46.5	29.8	25 23.3	12.0
15	102 20.7	88 29.2 . .	47.1	193 50.2 . .	08.9	25 48.3 . .	29.9	40 25.4 . .	12.0
O 16	117 23.2	103 29.8	47.5	208 52.9	09.1	40 50.2	29.9	55 27.5	12.1
17	132 25.7	118 30.4	48.0	223 55.7	09.2	55 52.1	30.0	70 29.7	12.1
18	147 28.1	133 31.0	N 4 48.5	238 58.4	S25 09.4	70 53.9	N22 30.0	85 31.8	N19 12.2
19	162 30.6	148 31.6	49.0	254 01.2	09.5	85 55.8	30.1	100 33.9	12.3
20	177 33.0	163 32.2	49.5	269 03.9	09.7	100 57.6	30.2	115 36.0	12.3
21	192 35.5	178 32.8 . .	50.0	284 06.7 . .	09.8	115 59.5 . .	30.2	130 38.2 . .	12.4
22	207 38.0	193 33.3	50.5	299 09.4	10.0	131 01.4	30.3	145 40.3	12.5
23	222 40.4	208 33.9	51.0	314 12.2	10.1	146 03.2	30.3	160 42.4	12.5
20 00	237 42.9	223 34.5	N 4 51.5	329 14.9	S25 10.3	161 05.1	N22 30.4	175 44.6	N19 12.6
01	252 45.4	238 35.1	52.0	344 17.7	10.4	176 06.9	30.4	190 46.7	12.7
02	267 47.8	253 35.7	52.5	359 20.4	10.6	191 08.8	30.5	205 48.8	12.7
03	282 50.3	268 36.2 . .	53.0	14 23.2 . .	10.7	206 10.6 . .	30.5	220 50.9 . .	12.8
04	297 52.8	283 36.8	53.5	29 26.0	10.9	221 12.5	30.6	235 53.1	12.8
05	312 55.2	298 37.4	54.0	44 28.7	11.0	236 14.4	30.7	250 55.2	12.9
06	327 57.7	313 38.0	N 4 54.5	59 31.5	S25 11.2	251 16.2	N22 30.7	265 57.3	N19 13.0
07	343 00.2	328 38.6	55.0	74 34.3	11.3	266 18.1	30.8	280 59.5	13.0
D 08	358 02.6	343 39.1	55.5	89 37.0	11.5	281 19.9	30.8	296 01.6	13.1
O 09	13 05.1	358 39.7 . .	56.0	104 39.8 . .	11.6	296 21.8 . .	30.9	311 03.7 . .	13.2
M 10	28 07.5	13 40.3	56.5	119 42.6	11.8	311 23.6	30.9	326 05.8	13.2
I 11	43 10.0	28 40.8	57.0	134 45.3	11.9	326 25.5	31.0	341 08.0	13.3
12	58 12.5	43 41.4	N 4 57.6	149 48.1	S25 12.1	341 27.3	N22 31.1	356 10.1	N19 13.4
N 13	73 14.9	58 42.0	58.1	164 50.9	12.2	356 29.2	31.1	11 12.2	13.4
G 14	88 17.4	73 42.5	58.6	179 53.7	12.4	11 31.1	31.2	26 14.4	13.5
O 15	103 19.9	88 43.1 . .	59.1	194 56.4 . .	12.5	26 32.9 . .	31.2	41 16.5 . .	13.5
16	118 22.3	103 43.7	4 59.6	209 59.2	12.7	41 34.8	31.3	56 18.6	13.6
17	133 24.8	118 44.2	5 00.1	225 02.0	12.8	56 36.6	31.3	71 20.7	13.7
18	148 27.3	133 44.8	N 5 00.6	240 04.8	S25 13.0	71 38.5	N22 31.4	86 22.9	N19 13.7
19	163 29.7	148 45.4	01.1	255 07.6	13.1	86 40.3	31.4	101 25.0	13.8
20	178 32.2	163 45.9	01.6	270 10.4	13.3	101 42.2	31.5	116 27.1	13.9
21	193 34.6	178 46.5 . .	02.2	285 13.2 . .	13.4	116 44.1 . .	31.6	131 29.3 . .	13.9
22	208 37.1	193 47.0	02.7	300 15.9	13.5	131 45.9	31.6	146 31.4	14.0
23	223 39.6	208 47.6	03.2	315 18.7	13.7	146 47.8	31.7	161 33.5	14.0
21 00	238 42.0	223 48.1	N 5 03.7	330 21.5	S25 13.8	161 49.6	N22 31.7	176 35.6	N19 14.1
01	253 44.5	238 48.7	04.2	345 24.3	14.0	176 51.5	31.8	191 37.8	14.2
02	268 47.0	253 49.2	04.7	0 27.1	14.1	191 53.3	31.8	206 39.9	14.2
03	283 49.4	268 49.8 . .	05.3	15 29.9 . .	14.3	206 55.2 . .	31.9	221 42.0 . .	14.3
04	298 51.9	283 50.3	05.8	30 32.7	14.4	221 57.0	31.9	236 44.2	14.4
05	313 54.4	298 50.9	06.3	45 35.5	14.6	236 58.9	32.0	251 46.3	14.4
06	328 56.8	313 51.4	N 5 06.8	60 38.3	S25 14.7	252 00.8	N22 32.1	266 48.4	N19 14.5
07	343 59.3	328 52.0	07.4	75 41.1	14.9	267 02.6	32.1	281 50.5	14.5
L 08	359 01.8	343 52.5	07.9	90 43.9	15.0	282 04.5	32.2	296 52.7	14.6
U 09	14 04.2	358 53.1 . .	08.4	105 46.7 . .	15.2	297 06.3 . .	32.2	311 54.8 . .	14.7
10	29 06.7	13 53.6	08.9	120 49.5	15.3	312 08.2	32.3	326 56.9	14.7
N 11	44 09.1	28 54.1	09.5	135 52.3	15.5	327 10.0	32.3	341 59.0	14.8
12	59 11.6	43 54.7	N 5 10.0	150 55.1	S25 15.6	342 11.9	N22 32.4	357 01.2	N19 14.9
E 13	74 14.1	58 55.2	10.5	165 58.0	15.8	357 13.7	32.4	12 03.3	14.9
14	89 16.5	73 55.8	11.0	181 00.8	15.9	12 15.6	32.5	27 05.4	15.0
S 15	104 19.0	88 56.3 . .	11.6	196 03.6 . .	16.1	27 17.5 . .	32.6	42 07.6 . .	15.1
16	119 21.5	103 56.8	12.1	211 06.4	16.2	42 19.3	32.6	57 09.7	15.1
17	134 23.9	118 57.4	12.6	226 09.2	16.4	57 21.2	32.7	72 11.8	15.2
18	149 26.4	133 57.9	N 5 13.2	241 12.0	S25 16.5	72 23.0	N22 32.7	87 13.9	N19 15.2
19	164 28.9	148 58.4	13.7	256 14.9	16.7	87 24.9	32.8	102 16.1	15.3
20	179 31.3	163 59.0	14.2	271 17.7	16.8	102 26.7	32.8	117 18.2	15.4
21	194 33.8	178 59.5 . .	14.8	286 20.5 . .	17.0	117 28.6 . .	32.9	132 20.3 . .	15.4
22	209 36.3	194 00.0	15.3	301 23.3	17.1	132 30.4	32.9	147 22.5	15.5
23	224 38.7	209 00.6	15.8	316 26.2	17.3	147 32.3	33.0	162 24.6	15.6
	h m								
Pas. Mer.	8 07.8	*v* 0.6	*d* 0.5	*v* 2.8	*d* 0.1	*v* 1.9	*d* 0.1	*v* 2.1	*d* 0.1

ESTRELLAS		
Nombre	A.H.S.	Dec.
	° ′	° ′
Acamar	315 25.9	S40 18.0
Achernar	335 34.2	S57 13.8
Acrux	173 19.6	S63 06.6
Adhara	255 20.3	S28 58.6
Aldebaran	291 00.7	N16 30.6
Alioth	166 28.5	N55 57.4
Alkaid	153 05.9	N49 18.6
Al Na'ir	27 55.6	S46 57.2
Alnilam	275 56.3	S 1 12.2
Alphard	218 05.5	S 8 39.9
Alphecca	126 18.7	N26 42.7
Alpheratz	357 53.6	N29 05.6
Altair	62 17.3	N 8 52.2
Ankaa	353 25.3	S42 17.9
Antares	112 37.6	S26 26.1
Arcturus	146 04.1	N19 10.6
Atria	107 47.5	S69 01.7
Avior	234 22.2	S59 31.1
Bellatrix	278 42.5	N 6 20.9
Betelgeuse	271 11.9	N 7 24.4
Canopus	264 00.8	S52 42.0
Capella	280 49.0	N45 59.9
Deneb	49 37.8	N45 16.8
Denebola	182 43.2	N14 34.0
Diphda	349 05.6	S17 58.9
Dubhe	194 03.0	N61 45.0
Elnath	278 25.0	N28 36.5
Eltanin	90 50.1	N51 29.2
Enif	33 56.4	N 9 52.7
Fomalhaut	15 34.5	S29 36.9
Gacrux	172 11.3	S57 07.4
Gienah	176 01.9	S17 33.0
Hadar	149 00.9	S60 22.8
Hamal	328 11.8	N23 27.9
Kaus Aust.	83 56.1	S34 23.0
Kochab	137 18.4	N74 09.2
Markab	13 47.9	N15 12.5
Menkar	314 25.3	N 4 05.5
Menkent	148 18.5	S36 22.6
Miaplacidus	221 42.0	S69 43.6
Mirfak	308 54.5	N49 51.8
Nunki	76 09.8	S26 17.7
Peacock	53 33.9	S56 43.7
Pollux	243 39.6	N28 01.5
Procyon	245 09.9	N 5 13.3
Rasalhague	96 15.0	N12 33.5
Regulus	207 53.6	N11 57.7
Rigel	281 21.5	S 8 12.1
Rigil Kent.	140 04.3	S60 50.5
Sabik	102 23.1	S15 43.6
Schedar	349 51.9	N56 32.3
Shaula	96 34.4	S37 06.2
Sirius	258 42.4	S16 43.2
Spica	158 41.0	S11 10.1
Suhail	222 59.6	S43 26.5
Vega	80 45.1	N38 46.9
Zuben'ubi	137 15.6	S16 02.8

	A.H.S.	Pas. Mer.
	° ′	h m
Venus	345 51.6	9 05
Marte	91 32.0	2 03
Júpiter	283 22.2	13 14
Saturno	298 01.7	12 15

T.U.	SOL				LUNA						
	A.H.G.		Dec.		A.H.G.	v		Dec.	d	P.H.	
d h	°	′	°	′	°	′	′	°	′	′	′
19 00	180	53.9	N19	44.0	227	25.0	14.9	S 1	36.6	12.3	55.5
01	195	53.9		44.5	241	58.9	14.8	1	24.3	12.4	55.5
02	210	53.9		45.0	256	32.7	14.8	1	11.9	12.3	55.6
03	225	53.8	. .	45.6	271	06.5	14.8	0	59.6	12.4	55.6
04	240	53.8		46.1	285	40.3	14.7	0	47.2	12.4	55.6
05	255	53.8		46.7	300	14.0	14.7	0	34.8	12.4	55.6
06	270	53.7	N19	47.2	314	47.7	14.7	S 0	22.4	12.4	55.7
07	285	53.7		47.7	329	21.4	14.7	S 0	10.0	12.4	55.7
S 08	300	53.7		48.3	343	55.1	14.6	N 0	02.4	12.5	55.7
A 09	315	53.6	. .	48.8	358	28.7	14.6	0	14.9	12.4	55.8
10	330	53.6		49.3	13	02.3	14.6	0	27.3	12.5	55.8
B 11	345	53.6		49.9	27	35.9	14.5	0	39.8	12.5	55.8
A 12	0	53.5	N19	50.4	42	09.4	14.5	N 0	52.3	12.5	55.8
13	15	53.5		50.9	56	42.9	14.5	1	04.8	12.5	55.9
D 14	30	53.5		51.4	71	16.4	14.5	1	17.3	12.5	55.9
15	45	53.4	. .	52.0	85	49.9	14.4	1	29.8	12.5	55.9
O 16	60	53.4		52.5	100	23.3	14.3	1	42.3	12.5	55.9
17	75	53.4		53.0	114	56.6	14.4	1	54.8	12.5	56.0
18	90	53.3	N19	53.6	129	30.0	14.2	N 2	07.3	12.5	56.0
19	105	53.3		54.1	144	03.2	14.3	2	19.8	12.5	56.0
20	120	53.3		54.6	158	36.5	14.2	2	32.3	12.6	56.1
21	135	53.2	. .	55.1	173	09.7	14.2	2	44.9	12.5	56.1
22	150	53.2		55.7	187	42.9	14.1	2	57.4	12.5	56.1
23	165	53.2		56.2	202	16.0	14.1	3	09.9	12.6	56.1
20 00	180	53.1	N19	56.7	216	49.1	14.0	N 3	22.5	12.5	56.2
01	195	53.1		57.2	231	22.1	14.0	3	35.0	12.5	56.2
02	210	53.1		57.8	245	55.1	14.0	3	47.5	12.6	56.2
03	225	53.0	. .	58.3	260	28.1	13.9	4	00.1	12.5	56.2
04	240	53.0		58.8	275	01.0	13.8	4	12.6	12.5	56.3
05	255	53.0		59.3	289	33.8	13.8	4	25.1	12.5	56.3
06	270	52.9	N19	59.8	304	06.6	13.8	N 4	37.6	12.5	56.3
07	285	52.9	20	00.4	318	39.4	13.7	4	50.1	12.5	56.4
D 08	300	52.8		00.9	333	12.1	13.6	5	02.6	12.5	56.4
O 09	315	52.8	. .	01.4	347	44.7	13.6	5	15.1	12.5	56.4
M 10	330	52.8		01.9	2	17.3	13.6	5	27.6	12.4	56.4
I 11	345	52.7		02.4	16	49.9	13.4	5	40.0	12.5	56.5
N 12	0	52.7	N20	03.0	31	22.3	13.5	N 5	52.5	12.5	56.5
G 13	15	52.7		03.5	45	54.8	13.4	6	05.0	12.4	56.5
O 14	30	52.6		04.0	60	27.2	13.3	6	17.4	12.4	56.6
15	45	52.6	. .	04.5	74	59.5	13.2	6	29.8	12.4	56.6
16	60	52.5		05.0	89	31.7	13.2	6	42.2	12.4	56.6
17	75	52.5		05.5	104	03.9	13.2	6	54.6	12.3	56.7
18	90	52.5	N20	06.0	118	36.1	13.1	N 7	06.9	12.4	56.7
19	105	52.4		06.6	133	08.2	13.0	7	19.3	12.3	56.7
20	120	52.4		07.1	147	40.2	12.9	7	31.6	12.3	56.7
21	135	52.3	. .	07.6	162	12.1	12.9	7	43.9	12.3	56.8
22	150	52.3		08.1	176	44.0	12.9	7	56.2	12.3	56.8
23	165	52.3		08.6	191	15.9	12.7	8	08.5	12.2	56.8
21 00	180	52.2	N20	09.1	205	47.6	12.7	N 8	20.7	12.2	56.9
01	195	52.2		09.6	220	19.3	12.7	8	32.9	12.2	56.9
02	210	52.1		10.1	234	51.0	12.5	8	45.1	12.1	56.9
03	225	52.1	. .	10.6	249	22.5	12.5	8	57.2	12.2	56.9
04	240	52.1		11.1	263	54.0	12.5	9	09.4	12.1	57.0
05	255	52.0		11.7	278	25.5	12.3	9	21.5	12.0	57.0
06	270	52.0	N20	12.2	292	56.8	12.3	N 9	33.5	12.0	57.0
07	285	51.9		12.7	307	28.1	12.2	9	45.5	12.0	57.1
L 08	300	51.9		13.2	321	59.3	12.2	9	57.5	12.0	57.1
09	315	51.8	. .	13.7	336	30.5	12.1	10	09.5	11.9	57.1
U 10	330	51.8		14.2	351	01.6	12.0	10	21.4	11.9	57.2
11	345	51.8		14.7	5	32.6	11.9	10	33.3	11.9	57.2
N 12	0	51.7	N20	15.2	20	03.5	11.8	N10	45.2	11.8	57.2
E 13	15	51.7		15.7	34	34.3	11.8	10	57.0	11.7	57.2
S 14	30	51.6		16.2	49	05.1	11.7	11	08.7	11.7	57.3
15	45	51.6	. .	16.7	63	35.8	11.6	11	20.4	11.7	57.3
16	60	51.5		17.2	78	06.4	11.6	11	32.1	11.7	57.3
17	75	51.5		17.7	92	37.0	11.4	11	43.8	11.5	57.4
18	90	51.4	N20	18.2	107	07.4	11.4	N11	55.3	11.6	57.4
19	105	51.4		18.7	121	37.8	11.3	12	06.9	11.5	57.4
20	120	51.4		19.2	136	08.1	11.2	12	18.4	11.4	57.4
21	135	51.3	. .	19.7	150	38.3	11.2	12	29.8	11.4	57.5
22	150	51.3		20.2	165	08.5	11.0	12	41.2	11.3	57.5
23	165	51.2		20.7	179	38.5	11.0	N12	52.5	11.3	57.5
	SD	15.8	d	0.5	SD	15.2		15.4		15.6	

Lat.	Crepúsculo Náutico	Crepúsculo Civil	Orto Sol	Orto Luna 19	Orto Luna 20	Orto Luna 21	Orto Luna 22
°	h m	h m	h m	h m	h m	h m	h m
N 72	▭	▭	▭	03 09	02 50	02 29	02 01
N 70	▭	▭	▭	03 08	02 55	02 42	02 25
68	////	////	01 16	03 07	02 59	02 52	02 44
66	////	////	02 02	03 06	03 03	03 01	02 59
64	////	00 12	02 31	03 05	03 06	03 08	03 12
62	////	01 29	02 53	03 04	03 09	03 15	03 22
60	////	02 03	03 11	03 03	03 11	03 20	03 32
N 58	00 10	02 27	03 26	03 03	03 13	03 25	03 40
56	01 20	02 46	03 38	03 02	03 15	03 30	03 47
54	01 52	03 02	03 49	03 02	03 17	03 34	03 53
52	02 14	03 16	03 59	03 01	03 19	03 37	03 59
50	02 32	03 27	04 08	03 01	03 20	03 41	04 04
45	03 06	03 51	04 26	03 00	03 23	03 48	04 16
N 40	03 31	04 09	04 41	02 59	03 26	03 54	04 25
35	03 50	04 25	04 53	02 59	03 28	03 59	04 33
30	04 06	04 37	05 04	02 58	03 30	04 04	04 41
20	04 30	04 58	05 22	02 57	03 34	04 12	04 53
N 10	04 49	05 16	05 38	02 57	03 37	04 19	05 04
0	05 05	05 31	05 53	02 56	03 40	04 26	05 15
S 10	05 20	05 45	06 08	02 55	03 43	04 33	05 25
20	05 33	06 00	06 23	02 54	03 46	04 40	05 36
30	05 46	06 15	06 41	02 54	03 50	04 48	05 49
35	05 53	06 24	06 51	02 53	03 52	04 53	05 57
40	06 00	06 33	07 03	02 52	03 54	04 59	06 05
45	06 08	06 44	07 17	02 52	03 57	05 05	06 16
S 50	06 17	06 57	07 33	02 51	04 01	05 13	06 28
52	06 21	07 03	07 41	02 51	04 02	05 17	06 34
54	06 25	07 09	07 50	02 50	04 04	05 21	06 40
56	06 30	07 16	08 00	02 50	04 06	05 25	06 47
58	06 34	07 24	08 11	02 49	04 08	05 30	06 55
S 60	06 40	07 33	08 24	02 49	04 11	05 36	07 04

Lat.	Ocaso Sol	Crepúsculo Civil	Crepúsculo Náutico	Ocaso Luna 19	Ocaso Luna 20	Ocaso Luna 21	Ocaso Luna 22
°	h m	h m	h m	h m	h m	h m	h m
N 72	▭	▭	▭	15 36	17 32	19 40	22 25
N 70	▭	▭	▭	15 34	17 22	19 17	21 30
68	22 43	////	////	15 32	17 13	19 00	20 57
66	21 54	////	////	15 31	17 06	18 46	20 33
64	21 24	////	////	15 30	17 00	18 35	20 15
62	21 01	22 28	////	15 29	16 55	18 25	20 00
60	20 43	21 53	////	15 28	16 51	18 17	19 47
N 58	20 28	21 28	////	15 27	16 47	18 10	19 36
56	20 16	21 08	22 37	15 26	16 43	18 04	19 27
54	20 05	20 52	22 04	15 25	16 40	17 58	19 18
52	19 55	20 39	21 40	15 25	16 38	17 53	19 11
50	19 46	20 27	21 22	15 24	16 35	17 48	19 04
45	19 28	20 03	20 48	15 23	16 30	17 38	18 50
N 40	19 13	19 44	20 23	15 22	16 25	17 30	18 38
35	19 00	19 29	20 04	15 21	16 21	17 23	18 28
30	18 50	19 16	19 48	15 20	16 18	17 17	18 19
20	18 31	18 55	19 23	15 19	16 12	17 07	18 04
N 10	18 15	18 37	19 04	15 18	16 06	16 57	17 51
0	18 00	18 22	18 48	15 17	16 01	16 49	17 39
S 10	17 45	18 08	18 33	15 16	15 57	16 40	17 27
20	17 30	17 53	18 20	15 14	15 51	16 31	17 14
30	17 12	17 38	18 07	15 13	15 45	16 20	16 59
35	17 02	17 29	18 00	15 12	15 42	16 14	16 51
40	16 50	17 19	17 52	15 11	15 38	16 08	16 41
45	16 36	17 08	17 44	15 10	15 34	16 00	16 30
S 50	16 19	16 56	17 35	15 09	15 28	15 50	16 16
52	16 11	16 50	17 32	15 08	15 26	15 46	16 10
54	16 03	16 43	17 27	15 08	15 23	15 41	16 03
56	15 53	16 36	17 23	15 07	15 20	15 36	15 55
58	15 41	16 28	17 18	15 06	15 17	15 30	15 46
S 60	15 28	16 19	17 12	15 05	15 14	15 23	15 36

Día	SOL E.T. (+) 00h	SOL E.T. (+) 12h	SOL Pas. Mer.	LUNA Pas. Mer. Sup.	LUNA Pas. Mer. Inf.	LUNA Edad	LUNA Fase
d	m s	m s	h m	h m	h m	d	%
19	03 36	03 34	11 56	09 06	21 28	26	14
20	03 33	03 31	11 56	09 51	22 13	27	8
21	03 29	03 27	11 57	10 37	23 01	28	3

T.U.	ARIES	VENUS −4.4		MARTE −1.8		JUPITER −1.9		SATURNO +0.1	
	A.H.G.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
22 00	239 41.2	224 01.1	N 5 16.4	331 29.0	S25 17.4	162 34.1	N22 33.0	177 26.7	N19 15.6
01	254 43.6	239 01.6	16.9	346 31.8	17.6	177 36.0	33.1	192 28.8	15.7
02	269 46.1	254 02.1	17.4	1 34.6	17.7	192 37.9	33.2	207 31.0	15.7
03	284 48.6	269 02.6 . .	18.0	16 37.5 . .	17.9	207 39.7 . .	33.2	222 33.1 . .	15.8
04	299 51.0	284 03.2	18.5	31 40.3	18.0	222 41.6	33.3	237 35.2	15.9
05	314 53.5	299 03.7	19.1	46 43.1	18.2	237 43.4	33.3	252 37.4	15.9
06	329 56.0	314 04.2	N 5 19.6	61 46.0	S25 18.3	252 45.3	N22 33.4	267 39.5	N19 16.0
07	344 58.4	329 04.7	20.1	76 48.8	18.5	267 47.1	33.4	282 41.6	16.1
M 08	0 00.9	344 05.2	20.7	91 51.7	18.6	282 49.0	33.5	297 43.7	16.1
A 09	15 03.4	359 05.8 . .	21.2	106 54.5 . .	18.8	297 50.8 . .	33.5	312 45.9 . .	16.2
R 10	30 05.8	14 06.3	21.8	121 57.3	18.9	312 52.7	33.6	327 48.0	16.2
11	45 08.3	29 06.8	22.3	137 00.2	19.1	327 54.5	33.6	342 50.1	16.3
T 12	60 10.7	44 07.3	N 5 22.9	152 03.0	S25 19.3	342 56.4	N22 33.7	357 52.2	N19 16.4
13	75 13.2	59 07.8	23.4	167 05.9	19.4	357 58.2	33.8	12 54.4	16.4
E 14	90 15.7	74 08.3	23.9	182 08.7	19.6	13 00.1	33.8	27 56.5	16.5
S 15	105 18.1	89 08.8 . .	24.5	197 11.6 . .	19.7	28 02.0 . .	33.9	42 58.6 . .	16.6
16	120 20.6	104 09.3	25.0	212 14.4	19.9	43 03.8	33.9	58 00.8	16.6
17	135 23.1	119 09.8	25.6	227 17.3	20.0	58 05.7	34.0	73 02.9	16.7
18	150 25.5	134 10.4	N 5 26.1	242 20.1	S25 20.2	73 07.5	N22 34.0	88 05.0	N19 16.7
19	165 28.0	149 10.9	26.7	257 23.0	20.3	88 09.4	34.1	103 07.1	16.8
20	180 30.5	164 11.4	27.2	272 25.8	20.5	103 11.2	34.1	118 09.3	16.9
21	195 32.9	179 11.9 . .	27.8	287 28.7 . .	20.6	118 13.1 . .	34.2	133 11.4 . .	16.9
22	210 35.4	194 12.4	28.3	302 31.6	20.8	133 14.9	34.2	148 13.5	17.0
23	225 37.9	209 12.9	28.9	317 34.4	20.9	148 16.8	34.3	163 15.6	17.1
23 00	240 40.3	224 13.4	N 5 29.4	332 37.3	S25 21.1	163 18.6	N22 34.4	178 17.8	N19 17.1
01	255 42.8	239 13.9	30.0	347 40.1	21.2	178 20.5	34.4	193 19.9	17.2
02	270 45.2	254 14.4	30.6	2 43.0	21.4	193 22.3	34.5	208 22.0	17.2
03	285 47.7	269 14.9 . .	31.1	17 45.9 . .	21.5	208 24.2 . .	34.5	223 24.2 . .	17.3
04	300 50.2	284 15.3	31.7	32 48.7	21.7	223 26.0	34.6	238 26.3	17.4
05	315 52.6	299 15.8	32.2	47 51.6	21.8	238 27.9	34.6	253 28.4	17.4
06	330 55.1	314 16.3	N 5 32.8	62 54.5	S25 22.0	253 29.7	N22 34.7	268 30.5	N19 17.5
M 07	345 57.6	329 16.8	33.3	77 57.3	22.1	268 31.6	34.7	283 32.7	17.6
I 08	1 00.0	344 17.3	33.9	93 00.2	22.3	283 33.5	34.8	298 34.8	17.6
E 09	16 02.5	359 17.8 . .	34.5	108 03.1 . .	22.4	298 35.3 . .	34.8	313 36.9 . .	17.7
R 10	31 05.0	14 18.3	35.0	123 06.0	22.6	313 37.2	34.9	328 39.1	17.7
C 11	46 07.4	29 18.8	35.6	138 08.9	22.7	328 39.0	34.9	343 41.2	17.8
O 12	61 09.9	44 19.3	N 5 36.1	153 11.7	S25 22.9	343 40.9	N22 35.0	358 43.3	N19 17.9
L 13	76 12.4	59 19.8	36.7	168 14.6	23.0	358 42.7	35.1	13 45.4	17.9
E 14	91 14.8	74 20.2	37.3	183 17.5	23.2	13 44.6	35.1	28 47.6	18.0
S 15	106 17.3	89 20.7 . .	37.8	198 20.4 . .	23.3	28 46.4 . .	35.2	43 49.7 . .	18.0
16	121 19.7	104 21.2	38.4	213 23.3	23.5	43 48.3	35.2	58 51.8	18.1
17	136 22.2	119 21.7	39.0	228 26.2	23.6	58 50.1	35.3	73 53.9	18.2
18	151 24.7	134 22.2	N 5 39.5	243 29.0	S25 23.8	73 52.0	N22 35.3	88 56.1	N19 18.2
19	166 27.1	149 22.6	40.1	258 31.9	23.9	88 53.8	35.4	103 58.2	18.3
20	181 29.6	164 23.1	40.7	273 34.8	24.1	103 55.7	35.4	119 00.3	18.4
21	196 32.1	179 23.6 . .	41.2	288 37.7 . .	24.2	118 57.5 . .	35.5	134 02.5 . .	18.4
22	211 34.5	194 24.1	41.8	303 40.6	24.4	133 59.4	35.5	149 04.6	18.5
23	226 37.0	209 24.5	42.4	318 43.5	24.5	149 01.2	35.6	164 06.7	18.5
24 00	241 39.5	224 25.0	N 5 42.9	333 46.4	S25 24.7	164 03.1	N22 35.6	179 08.8	N19 18.6
01	256 41.9	239 25.5	43.5	348 49.3	24.8	179 04.9	35.7	194 11.0	18.7
02	271 44.4	254 26.0	44.1	3 52.2	25.0	194 06.8	35.7	209 13.1	18.7
03	286 46.9	269 26.4 . .	44.7	18 55.1 . .	25.1	209 08.6 . .	35.8	224 15.2 . .	18.8
04	301 49.3	284 26.9	45.2	33 58.0	25.3	224 10.5	35.8	239 17.3	18.9
05	316 51.8	299 27.4	45.8	49 00.9	25.4	239 12.3	35.9	254 19.5	18.9
06	331 54.2	314 27.8	N 5 46.4	64 03.8	S25 25.6	254 14.2	N22 36.0	269 21.6	N19 19.0
07	346 56.7	329 28.3	46.9	79 06.7	25.7	269 16.1	36.0	284 23.7	19.0
J 08	1 59.2	344 28.8	47.5	94 09.6	25.9	284 17.9	36.1	299 25.9	19.1
U 09	17 01.6	359 29.2 . .	48.1	109 12.5 . .	26.0	299 19.8 . .	36.1	314 28.0 . .	19.2
E 10	32 04.1	14 29.7	48.7	124 15.4	26.2	314 21.6	36.2	329 30.1	19.2
V 11	47 06.6	29 30.1	49.3	139 18.4	26.3	329 23.5	36.2	344 32.2	19.3
12	62 09.0	44 30.6	N 5 49.8	154 21.3	S25 26.5	344 25.3	N22 36.3	359 34.4	N19 19.3
E 13	77 11.5	59 31.1	50.4	169 24.2	26.6	359 27.2	36.3	14 36.5	19.4
14	92 14.0	74 31.5	51.0	184 27.1	26.8	14 29.0	36.4	29 38.6	19.5
S 15	107 16.4	89 32.0 . .	51.6	199 30.0 . .	26.9	29 30.9 . .	36.4	44 40.7 . .	19.5
16	122 18.9	104 32.4	52.2	214 32.9	27.1	44 32.7	36.5	59 42.9	19.6
17	137 21.4	119 32.9	52.7	229 35.9	27.2	59 34.6	36.5	74 45.0	19.7
18	152 23.8	134 33.3	N 5 53.3	244 38.8	S25 27.4	74 36.4	N22 36.6	89 47.1	N19 19.7
19	167 26.3	149 33.8	53.9	259 41.7	27.5	89 38.3	36.6	104 49.3	19.8
20	182 28.7	164 34.3	54.5	274 44.6	27.7	104 40.1	36.7	119 51.4	19.8
21	197 31.2	179 34.7 . .	55.1	289 47.6 . .	27.8	119 42.0 . .	36.7	134 53.5 . .	19.9
22	212 33.7	194 35.2	55.6	304 50.5	28.0	134 43.8	36.8	149 55.6	20.0
23	227 36.1	209 35.6	56.2	319 53.4	28.1	149 45.7	36.8	164 57.8	20.0
	h m								
Pas. Mer.	7 56.0	*v* 0.5	*d* 0.6	*v* 2.9	*d* 0.2	*v* 1.9	*d* 0.1	*v* 2.1	*d* 0.1

ESTRELLAS		
Nombre	A.H.S.	Dec.
	° ′	° ′
Acamar	315 25.9	S40 18.0
Achernar	335 34.2	S57 13.8
Acrux	173 19.7	S63 06.6
Adhara	255 20.3	S28 58.6
Aldebaran	291 00.6	N16 30.6
Alioth	166 28.5	N55 57.4
Alkaid	153 05.9	N49 18.6
Al Na'ir	27 55.5	S46 57.1
Alnilam	275 56.3	S 1 12.2
Alphard	218 05.5	S 8 39.9
Alphecca	126 18.7	N26 42.7
Alpheratz	357 53.5	N29 05.6
Altair	62 17.3	N 8 52.2
Ankaa	353 25.2	S42 17.9
Antares	112 37.6	S26 26.1
Arcturus	146 04.1	N19 10.6
Atria	107 47.5	S69 01.7
Avior	234 22.3	S59 31.1
Bellatrix	278 42.5	N 6 21.0
Betelgeuse	271 11.9	N 7 24.4
Canopus	264 00.8	S52 42.0
Capella	280 49.0	N45 59.9
Deneb	49 37.8	N45 16.8
Denebola	182 43.2	N14 34.0
Diphda	349 05.6	S17 58.8
Dubhe	194 03.0	N61 45.0
Elnath	278 25.0	N28 36.5
Eltanin	90 50.1	N51 29.2
Enif	33 56.4	N 9 52.7
Fomalhaut	15 34.5	S29 36.9
Gacrux	172 11.3	S57 07.4
Gienah	176 01.9	S17 33.0
Hadar	149 00.9	S60 22.8
Hamal	328 11.8	N23 27.9
Kaus Aust.	83 56.1	S34 23.0
Kochab	137 18.4	N74 09.2
Markab	13 47.9	N15 12.5
Menkar	314 25.3	N 4 05.5
Menkent	148 18.5	S36 22.6
Miaplacidus	221 42.1	S69 43.6
Mirfak	308 54.5	N49 51.8
Nunki	76 09.8	S26 17.7
Peacock	53 33.8	S56 43.7
Pollux	243 39.6	N28 01.5
Procyon	245 09.9	N 5 13.3
Rasalhague	96 14.9	N12 33.5
Regulus	207 53.6	N11 57.7
Rigel	281 21.5	S 8 12.1
Rigil Kent.	140 04.3	S60 50.5
Sabik	102 23.1	S15 43.6
Schedar	349 51.8	N56 32.3
Shaula	96 34.4	S37 06.2
Sirius	258 42.4	S16 43.2
Spica	158 41.0	S11 10.1
Suhail	222 59.6	S43 26.5
Vega	80 45.0	N38 46.9
Zuben'ubi	137 15.6	S16 02.8

	A.H.S.	Pas. Mer.
	° ′	h m
Venus	343 33.0	9 03
Marte	91 57.0	1 49
Júpiter	282 38.3	13 05
Saturno	297 37.5	12 05

T.U.	SOL				LUNA					
	A.H.G.		Dec.		A.H.G.	v	Dec.	d	P.H.	
d h	°	′	°	′	°	′	′	°	′	′	′
22 00	180	51.2	N20	21.2	194	08.5	10.9	N13	03.8	11.2	57.6
01	195	51.1		21.7	208	38.4	10.8	13	15.0	11.2	57.6
02	210	51.1		22.2	223	08.2	10.8	13	26.2	11.1	57.6
03	225	51.0	. .	22.7	237	38.0	10.6	13	37.3	11.1	57.6
04	240	51.0		23.1	252	07.6	10.6	13	48.4	10.9	57.7
05	255	50.9		23.6	266	37.2	10.4	13	59.3	11.0	57.7
06	270	50.9	N20	24.1	281	06.6	10.4	N14	10.3	10.8	57.7
07	285	50.8		24.6	295	36.0	10.3	14	21.1	10.8	57.8
M 08	300	50.8		25.1	310	05.3	10.2	14	31.9	10.7	57.8
A 09	315	50.7	. .	25.6	324	34.5	10.2	14	42.6	10.7	57.8
R 10	330	50.7		26.1	339	03.7	10.0	14	53.3	10.6	57.8
11	345	50.6		26.6	353	32.7	10.0	15	03.9	10.5	57.9
T 12	0	50.6	N20	27.1	8	01.7	9.8	N15	14.4	10.4	57.9
13	15	50.6		27.6	22	30.5	9.8	15	24.8	10.4	57.9
E 14	30	50.5		28.0	36	59.3	9.7	15	35.2	10.3	58.0
S 15	45	50.5	. .	28.5	51	28.0	9.6	15	45.5	10.2	58.0
16	60	50.4		29.0	65	56.6	9.5	15	55.7	10.2	58.0
17	75	50.4		29.5	80	25.1	9.4	16	05.9	10.0	58.0
18	90	50.3	N20	30.0	94	53.5	9.3	N16	15.9	10.0	58.1
19	105	50.2		30.5	109	21.8	9.3	16	25.9	9.9	58.1
20	120	50.2		31.0	123	50.1	9.1	16	35.8	9.8	58.1
21	135	50.1	. .	31.4	138	18.2	9.1	16	45.6	9.7	58.1
22	150	50.1		31.9	152	46.3	9.0	16	55.3	9.7	58.2
23	165	50.0		32.4	167	14.3	8.9	17	05.0	9.5	58.2
23 00	180	50.0	N20	32.9	181	42.2	8.8	N17	14.5	9.5	58.2
01	195	49.9		33.4	196	10.0	8.7	17	24.0	9.3	58.2
02	210	49.9		33.8	210	37.7	8.6	17	33.3	9.3	58.3
03	225	49.8	. .	34.3	225	05.3	8.5	17	42.6	9.2	58.3
04	240	49.8		34.8	239	32.8	8.4	17	51.8	9.1	58.3
05	255	49.7		35.3	254	00.2	8.4	18	00.9	9.0	58.3
06	270	49.7	N20	35.8	268	27.6	8.2	N18	09.9	8.8	58.4
M 07	285	49.6		36.2	282	54.8	8.2	18	18.7	8.8	58.4
I 08	300	49.6		36.7	297	22.0	8.1	18	27.5	8.7	58.4
E 09	315	49.5	. .	37.2	311	49.1	8.0	18	36.2	8.6	58.4
R 10	330	49.5		37.7	326	16.1	7.9	18	44.8	8.5	58.5
C 11	345	49.4		38.1	340	43.0	7.8	18	53.3	8.3	58.5
O 12	0	49.4	N20	38.6	355	09.8	7.7	N19	01.6	8.3	58.5
L 13	15	49.3		39.1	9	36.5	7.7	19	09.9	8.2	58.5
E 14	30	49.2		39.5	24	03.2	7.5	19	18.1	8.0	58.6
S 15	45	49.2	. .	40.0	38	29.7	7.5	19	26.1	7.9	58.6
16	60	49.1		40.5	52	56.2	7.4	19	34.0	7.9	58.6
17	75	49.1		41.0	67	22.6	7.3	19	41.9	7.7	58.6
18	90	49.0	N20	41.4	81	48.9	7.2	N19	49.6	7.6	58.6
19	105	49.0		41.9	96	15.1	7.1	19	57.2	7.4	58.7
20	120	48.9		42.4	110	41.2	7.0	20	04.6	7.4	58.7
21	135	48.8	. .	42.8	125	07.2	7.0	20	12.0	7.2	58.7
22	150	48.8		43.3	139	33.2	6.9	20	19.2	7.1	58.7
23	165	48.7		43.8	153	59.1	6.8	20	26.3	7.0	58.7
24 00	180	48.7	N20	44.2	168	24.9	6.7	N20	33.3	6.9	58.8
01	195	48.6		44.7	182	50.6	6.6	20	40.2	6.7	58.8
02	210	48.6		45.2	197	16.2	6.6	20	46.9	6.6	58.8
03	225	48.5	. .	45.6	211	41.8	6.5	20	53.5	6.5	58.8
04	240	48.4		46.1	226	07.3	6.4	21	00.0	6.4	58.9
05	255	48.4		46.6	240	32.7	6.3	21	06.4	6.2	58.9
06	270	48.3	N20	47.0	254	58.0	6.3	N21	12.6	6.1	58.9
07	285	48.3		47.5	269	23.3	6.2	21	18.7	6.0	58.9
J 08	300	48.2		47.9	283	48.5	6.1	21	24.7	5.8	58.9
U 09	315	48.2	. .	48.4	298	13.6	6.0	21	30.5	5.7	58.9
E 10	330	48.1		48.9	312	38.6	6.0	21	36.2	5.5	59.0
11	345	48.0		49.3	327	03.6	5.9	21	41.7	5.5	59.0
V 12	0	48.0	N20	49.8	341	28.5	5.8	N21	47.2	5.3	59.0
13	15	47.9		50.2	355	53.3	5.8	21	52.5	5.1	59.0
E 14	30	47.9		50.7	10	18.1	5.7	21	57.6	5.0	59.0
S 15	45	47.8	. .	51.2	24	42.8	5.7	22	02.6	4.9	59.1
16	60	47.7		51.6	39	07.5	5.5	22	07.5	4.7	59.1
17	75	47.7		52.1	53	32.0	5.5	22	12.2	4.5	59.1
18	90	47.6	N20	52.5	67	56.5	5.5	N22	16.7	4.5	59.1
19	105	47.6		53.0	82	21.0	5.4	22	21.2	4.3	59.1
20	120	47.5		53.4	96	45.4	5.3	22	25.5	4.1	59.1
21	135	47.4	. .	53.9	111	09.7	5.3	22	29.6	4.0	59.1
22	150	47.4		54.3	125	34.0	5.3	22	33.6	3.8	59.2
23	165	47.3		54.8	139	58.3	5.2	N22	37.4	3.7	59.2
	SD	15.8	d	0.5	SD	15.8		15.9			16.1

Lat.	Crepúsculo Náutico	Crepúsculo Civil	Orto Sol	Orto Luna 22	Orto Luna 23	Orto Luna 24	Orto Luna 25
°	h m	h m	h m	h m	h m	h m	h m
N 72	▭	▭	▭	02 01	01 03	▭	▭
N 70	▭	▭	▭	02 25	01 59	▭	▭
68	////	////	00 53	02 44	02 34	02 16	▭
66	////	////	01 50	02 59	02 58	03 00	03 10
64	////	////	02 22	03 12	03 18	03 30	03 55
62	////	01 14	02 46	03 22	03 34	03 52	04 25
60	////	01 53	03 05	03 32	03 47	04 11	04 47
N 58	////	02 20	03 20	03 40	03 59	04 26	05 06
56	01 07	02 40	03 34	03 47	04 09	04 39	05 21
54	01 43	02 57	03 45	03 53	04 18	04 50	05 34
52	02 08	03 11	03 55	03 59	04 26	05 01	05 46
50	02 27	03 23	04 04	04 04	04 33	05 10	05 56
45	03 02	03 48	04 23	04 16	04 49	05 29	06 18
N 40	03 28	04 07	04 38	04 25	05 01	05 44	06 36
35	03 48	04 23	04 51	04 33	05 12	05 58	06 50
30	04 04	04 36	05 02	04 41	05 22	06 09	07 03
20	04 29	04 57	05 21	04 53	05 39	06 29	07 25
N 10	04 49	05 15	05 38	05 04	05 53	06 47	07 45
0	05 05	05 31	05 53	05 15	06 07	07 03	08 02
S 10	05 20	05 46	06 08	05 25	06 21	07 20	08 20
20	05 34	06 01	06 24	05 36	06 36	07 37	08 40
30	05 48	06 17	06 43	05 49	06 53	07 58	09 02
35	05 55	06 26	06 53	05 57	07 03	08 10	09 15
40	06 03	06 36	07 05	06 05	07 14	08 24	09 30
45	06 11	06 47	07 20	06 16	07 28	08 40	09 48
S 50	06 20	07 00	07 37	06 28	07 45	09 00	10 11
52	06 24	07 06	07 45	06 34	07 52	09 10	10 22
54	06 29	07 13	07 54	06 40	08 01	09 21	10 34
56	06 34	07 21	08 05	06 47	08 11	09 33	10 48
58	06 39	07 29	08 16	06 55	08 22	09 48	11 04
S 60	06 44	07 38	08 30	07 04	08 35	10 05	11 24

Lat.	Ocaso Sol	Crepúsculo Civil	Crepúsculo Náutico	Ocaso Luna 22	Ocaso Luna 23	Ocaso Luna 24	Ocaso Luna 25
°	h m	h m	h m	h m	h m	h m	h m
N 72	▭	▭	▭	22 25	▭	▭	▭
N 70	▭	▭	▭	21 30	▭	▭	▭
68	23 09	////	////	20 57	23 10	▭	▭
66	22 07	////	////	20 33	22 26	24 19	00 19
64	21 34	////	////	20 15	21 57	23 34	24 49
62	21 09	22 44	////	20 00	21 35	23 05	24 16
60	20 50	22 03	////	19 47	21 17	22 42	23 52
N 58	20 34	21 36	////	19 36	21 02	22 24	23 33
56	20 21	21 15	22 51	19 27	20 50	22 09	23 17
54	20 09	20 58	22 13	19 18	20 39	21 56	23 03
52	19 59	20 44	21 48	19 11	20 29	21 44	22 51
50	19 50	20 31	21 28	19 04	20 20	21 34	22 40
45	19 31	20 06	20 52	18 50	20 02	21 13	22 18
N 40	19 16	19 47	20 26	18 38	19 47	20 56	22 00
35	19 03	19 31	20 06	18 28	19 35	20 41	21 45
30	18 51	19 18	19 50	18 19	19 24	20 29	21 32
20	18 32	18 56	19 25	18 04	19 05	20 07	21 09
N 10	18 16	18 38	19 05	17 51	18 49	19 49	20 50
0	18 00	18 22	18 48	17 39	18 33	19 31	20 31
S 10	17 45	18 07	18 33	17 27	18 18	19 14	20 13
20	17 29	17 52	18 19	17 14	18 02	18 55	19 54
30	17 11	17 36	18 06	16 59	17 43	18 34	19 31
35	17 00	17 27	17 58	16 51	17 33	18 21	19 18
40	16 48	17 17	17 51	16 41	17 20	18 07	19 03
45	16 33	17 06	17 42	16 30	17 06	17 50	18 44
S 50	16 16	16 53	17 33	16 16	16 48	17 29	18 22
52	16 08	16 46	17 29	16 10	16 40	17 19	18 11
54	15 59	16 40	17 24	16 03	16 31	17 08	17 59
56	15 48	16 32	17 19	15 55	16 20	16 55	17 45
58	15 36	16 24	17 14	15 46	16 08	16 41	17 28
S 60	15 23	16 15	17 08	15 36	15 55	16 23	17 08

Día	SOL E.T. (+) 00h	SOL E.T. (+) 12h	SOL Pas. Mer.	LUNA Pas. Sup.	LUNA Mer. Inf.	LUNA Edad	LUNA Fase
d	m s	m s	h m	h m	h m	d	%
22	03 25	03 22	11 57	11 27	23 53	29	1
23	03 20	03 18	11 57	12 20	24 48	00	0
24	03 15	03 12	11 57	13 17	00 48	01	2

T.U.	ARIES	VENUS −4.4		MARTE −1.9		JUPITER −1.9		SATURNO +0.1	
d h	A.H.G.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.
	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
25 00	242 38.6	224 36.0	N 5 56.8	334 56.3	S25 28.3	164 47.5	N22 36.9	179 59.9	N19 20.1
01	257 41.1	239 36.5	57.4	349 59.3	28.4	179 49.4	36.9	195 02.0	20.2
02	272 43.5	254 36.9	58.0	5 02.2	28.6	194 51.2	37.0	210 04.1	20.2
03	287 46.0	269 37.4	. . 58.6	20 05.1	. . 28.7	209 53.1	. . 37.1	225 06.3	. . 20.3
04	302 48.5	284 37.8	59.2	35 08.1	28.9	224 54.9	37.1	240 08.4	20.3
05	317 50.9	299 38.3	5 59.8	50 11.0	29.0	239 56.8	37.2	255 10.5	20.4
06	332 53.4	314 38.7	N 6 00.3	65 14.0	S25 29.2	254 58.6	N22 37.2	270 12.7	N19 20.5
07	347 55.8	329 39.2	00.9	80 16.9	29.3	270 00.5	37.3	285 14.8	20.5
V 08	2 58.3	344 39.6	01.5	95 19.8	29.5	285 02.3	37.3	300 16.9	20.6
I 09	18 00.8	359 40.0	. . 02.1	110 22.8	. . 29.6	300 04.2	. . 37.4	315 19.0	. . 20.6
E 10	33 03.2	14 40.5	02.7	125 25.7	29.8	315 06.0	37.4	330 21.2	20.7
R 11	48 05.7	29 40.9	03.3	140 28.7	29.9	330 07.9	37.5	345 23.3	20.8
N 12	63 08.2	44 41.3	N 6 03.9	155 31.6	S25 30.1	345 09.7	N22 37.5	0 25.4	N19 20.8
E 13	78 10.6	59 41.8	04.5	170 34.6	30.2	0 11.6	37.6	15 27.5	20.9
S 14	93 13.1	74 42.2	05.1	185 37.5	30.4	15 13.4	37.6	30 29.7	21.0
15	108 15.6	89 42.6	. . 05.7	200 40.5	. . 30.5	30 15.3	. . 37.7	45 31.8	. . 21.0
16	123 18.0	104 43.1	06.3	215 43.4	30.7	45 17.1	37.7	60 33.9	21.1
17	138 20.5	119 43.5	06.9	230 46.4	30.9	60 19.0	37.8	75 36.1	21.1
18	153 23.0	134 43.9	N 6 07.5	245 49.3	S25 31.0	75 20.8	N22 37.8	90 38.2	N19 21.2
19	168 25.4	149 44.4	08.1	260 52.3	31.2	90 22.7	37.9	105 40.3	21.3
20	183 27.9	164 44.8	08.7	275 55.2	31.3	105 24.5	37.9	120 42.4	21.3
21	198 30.3	179 45.2	. . 09.3	290 58.2	. . 31.5	120 26.4	. . 38.0	135 44.6	. . 21.4
22	213 32.8	194 45.6	09.9	306 01.2	31.6	135 28.2	38.0	150 46.7	21.4
23	228 35.3	209 46.1	10.5	321 04.1	31.8	150 30.1	38.1	165 48.8	21.5
26 00	243 37.7	224 46.5	N 6 11.1	336 07.1	S25 31.9	165 31.9	N22 38.1	180 50.9	N19 21.6
01	258 40.2	239 46.9	11.7	351 10.1	32.1	180 33.8	38.2	195 53.1	21.6
02	273 42.7	254 47.3	12.3	6 13.0	32.2	195 35.6	38.2	210 55.2	21.7
03	288 45.1	269 47.8	. . 12.9	21 16.0	. . 32.4	210 37.5	. . 38.3	225 57.3	. . 21.7
04	303 47.6	284 48.2	13.5	36 19.0	32.5	225 39.3	38.3	240 59.5	21.8
05	318 50.1	299 48.6	14.1	51 21.9	32.7	240 41.2	38.4	256 01.6	21.9
06	333 52.5	314 49.0	N 6 14.7	66 24.9	S25 32.8	255 43.0	N22 38.4	271 03.7	N19 21.9
07	348 55.0	329 49.4	15.3	81 27.9	33.0	270 44.9	38.5	286 05.8	22.0
S 08	3 57.5	344 49.8	15.9	96 30.9	33.1	285 46.7	38.5	301 08.0	22.1
A 09	18 59.9	359 50.3	. . 16.5	111 33.8	. . 33.3	300 48.6	. . 38.6	316 10.1	. . 22.1
B 10	34 02.4	14 50.7	17.1	126 36.8	33.4	315 50.4	38.6	331 12.2	22.2
A 11	49 04.8	29 51.1	17.7	141 39.8	33.6	330 52.3	38.7	346 14.3	22.2
D 12	64 07.3	44 51.5	N 6 18.3	156 42.8	S25 33.7	345 54.1	N22 38.7	1 16.5	N19 22.3
O 13	79 09.8	59 51.9	18.9	171 45.7	33.9	0 56.0	38.8	16 18.6	22.4
14	94 12.2	74 52.3	19.5	186 48.7	34.0	15 57.8	38.9	31 20.7	22.4
15	109 14.7	89 52.7	. . 20.1	201 51.7	. . 34.2	30 59.7	. . 38.9	46 22.9	. . 22.5
16	124 17.2	104 53.1	20.8	216 54.7	34.3	46 01.5	39.0	61 25.0	22.5
17	139 19.6	119 53.5	21.4	231 57.7	34.5	61 03.4	39.0	76 27.1	22.6
18	154 22.1	134 53.9	N 6 22.0	247 00.7	S25 34.6	76 05.2	N22 39.1	91 29.2	N19 22.7
19	169 24.6	149 54.3	22.6	262 03.7	34.8	91 07.0	39.1	106 31.4	22.7
20	184 27.0	164 54.7	23.2	277 06.7	34.9	106 08.9	39.2	121 33.5	22.8
21	199 29.5	179 55.1	. . 23.8	292 09.6	. . 35.1	121 10.7	. . 39.2	136 35.6	. . 22.9
22	214 32.0	194 55.6	24.4	307 12.6	35.2	136 12.6	39.3	151 37.7	22.9
23	229 34.4	209 56.0	25.0	322 15.6	35.4	151 14.4	39.3	166 39.9	23.0
27 00	244 36.9	224 56.4	N 6 25.7	337 18.6	S25 35.5	166 16.3	N22 39.4	181 42.0	N19 23.0
01	259 39.3	239 56.8	26.3	352 21.6	35.7	181 18.1	39.4	196 44.1	23.1
02	274 41.8	254 57.1	26.9	7 24.6	35.8	196 20.0	39.5	211 46.2	23.2
03	289 44.3	269 57.5	. . 27.5	22 27.6	. . 36.0	211 21.8	. . 39.5	226 48.4	. . 23.2
04	304 46.7	284 57.9	28.1	37 30.6	36.1	226 23.7	39.6	241 50.5	23.3
05	319 49.2	299 58.3	28.7	52 33.6	36.3	241 25.5	39.6	256 52.6	23.3
06	334 51.7	314 58.7	N 6 29.4	67 36.6	S25 36.4	256 27.4	N22 39.7	271 54.8	N19 23.4
07	349 54.1	329 59.1	30.0	82 39.6	36.6	271 29.2	39.7	286 56.9	23.5
D 08	4 56.6	344 59.5	30.6	97 42.6	36.7	286 31.1	39.8	301 59.0	23.5
O 09	19 59.1	359 59.9	. . 31.2	112 45.7	. . 36.9	301 32.9	. . 39.8	317 01.1	. . 23.6
M 10	35 01.5	15 00.3	31.8	127 48.7	37.0	316 34.8	39.9	332 03.3	23.6
I 11	50 04.0	30 00.7	32.5	142 51.7	37.2	331 36.6	39.9	347 05.4	23.7
N 12	65 06.5	45 01.1	N 6 33.1	157 54.7	S25 37.3	346 38.5	N22 40.0	2 07.5	N19 23.8
G 13	80 08.9	60 01.5	33.7	172 57.7	37.5	1 40.3	40.0	17 09.6	23.8
O 14	95 11.4	75 01.8	34.3	188 00.7	37.6	16 42.2	40.1	32 11.8	23.9
15	110 13.8	90 02.2	. . 34.9	203 03.7	. . 37.8	31 44.0	. . 40.1	47 13.9	. . 23.9
16	125 16.3	105 02.6	35.6	218 06.8	37.9	46 45.9	40.2	62 16.0	24.0
17	140 18.8	120 03.0	36.2	233 09.8	38.1	61 47.7	40.2	77 18.2	24.1
18	155 21.2	135 03.4	N 6 36.8	248 12.8	S25 38.2	76 49.6	N22 40.3	92 20.3	N19 24.1
19	170 23.7	150 03.8	37.4	263 15.8	38.3	91 51.4	40.3	107 22.4	24.2
20	185 26.2	165 04.1	38.1	278 18.8	38.5	106 53.3	40.4	122 24.5	24.2
21	200 28.6	180 04.5	. . 38.7	293 21.9	. . 38.6	121 55.1	. . 40.4	137 26.7	. . 24.3
22	215 31.1	195 04.9	39.3	308 24.9	38.8	136 56.9	40.5	152 28.8	24.4
23	230 33.6	210 05.3	39.9	323 27.9	38.9	151 58.8	40.5	167 30.9	24.4
	h m								
Pas. Mer.	7 44.2	v 0.4	d 0.6	v 3.0	d 0.2	v 1.8	d 0.1	v 2.1	d 0.1

ESTRELLAS

Nombre	A.H.S.	Dec.
	° ′	° ′
Acamar	315 25.9	S40 18.0
Achernar	335 34.2	S57 13.7
Acrux	173 19.7	S63 06.6
Adhara	255 20.3	S28 58.6
Aldebaran	291 00.6	N16 30.6
Alioth	166 28.6	N55 57.4
Alkaid	153 05.9	N49 18.6
Al Na'ir	27 55.5	S46 57.1
Alnilam	275 56.3	S 1 12.2
Alphard	218 05.5	S 8 39.9
Alphecca	126 18.7	N26 42.7
Alpheratz	357 53.5	N29 05.6
Altair	62 17.3	N 8 52.2
Ankaa	353 25.2	S42 17.9
Antares	112 37.6	S26 26.1
Arcturus	146 04.1	N19 10.6
Atria	107 47.4	S69 01.7
Avior	234 22.3	S59 31.1
Bellatrix	278 42.5	N 6 21.0
Betelgeuse	271 11.9	N 7 24.4
Canopus	264 00.8	S52 42.0
Capella	280 49.0	N45 59.9
Deneb	49 37.8	N45 16.8
Denebola	182 43.2	N14 34.0
Diphda	349 05.6	S17 58.8
Dubhe	194 03.1	N61 45.0
Elnath	278 25.0	N28 36.5
Eltanin	90 50.1	N51 29.2
Enif	33 56.4	N 9 52.7
Fomalhaut	15 34.4	S29 36.9
Gacrux	172 11.3	S57 07.4
Gienah	176 01.9	S17 33.0
Hadar	149 00.9	S60 22.9
Hamal	328 11.8	N23 27.9
Kaus Aust.	83 56.0	S34 23.0
Kochab	137 18.4	N74 09.2
Markab	13 47.9	N15 12.5
Menkar	314 25.3	N 4 05.5
Menkent	148 18.5	S36 22.7
Miaplacidus	221 42.1	S69 43.6
Mirfak	308 54.5	N49 51.8
Nunki	76 09.8	S26 17.7
Peacock	53 33.8	S56 43.7
Pollux	243 39.6	N28 01.5
Procyon	245 09.9	N 5 13.3
Rasalhague	96 14.9	N12 33.5
Regulus	207 53.6	N11 57.7
Rigel	281 21.5	S 8 12.1
Rigil Kent.	140 04.3	S60 50.5
Sabik	102 23.1	S15 43.6
Schedar	349 51.8	N56 32.3
Shaula	96 34.4	S37 06.2
Sirius	258 42.4	S16 43.2
Spica	158 41.0	S11 10.1
Suhail	222 59.6	S43 26.5
Vega	80 45.0	N38 47.0
Zuben'ubi	137 15.6	S16 02.8

	A.H.S.	Pas. Mer.
	° ′	h m
Venus	341 08.7	9 01
Marte	92 29.4	1 35
Júpiter	281 54.2	12 56
Saturno	297 13.2	11 55

T.U.	SOL A.H.G.	SOL Dec.	LUNA A.H.G.	v	LUNA Dec.	d	P.H.
d h	° ′	° ′	° ′	′	° ′	′	′
25 00	180 47.2	N20 55.2	154 22.5	5.1	N22 41.1	3.6	59.2
01	195 47.2	55.7	168 46.6	5.1	22 44.7	3.3	59.2
02	210 47.1	56.1	183 10.7	5.0	22 48.0	3.3	59.2
03	225 47.1	56.6	197 34.7	5.0	22 51.3	3.1	59.2
04	240 47.0	57.0	211 58.7	4.9	22 54.4	2.9	59.2
05	255 46.9	57.5	226 22.6	4.9	22 57.3	2.8	59.3
06	270 46.9	N20 57.9	240 46.5	4.9	N23 00.1	2.6	59.3
07	285 46.8	58.4	255 10.4	4.8	23 02.7	2.5	59.3
V 08	300 46.7	58.8	269 34.2	4.8	23 05.2	2.3	59.3
I 09	315 46.7	59.3	283 58.0	4.8	23 07.5	2.1	59.3
E 10	330 46.6	20 59.7	298 21.8	4.7	23 09.6	2.0	59.3
11	345 46.5	21 00.2	312 45.5	4.7	23 11.6	1.9	59.3
R 12	0 46.5	N21 00.6	327 09.2	4.7	N23 13.5	1.7	59.3
N 13	15 46.4	01.0	341 32.9	4.6	23 15.2	1.5	59.4
E 14	30 46.3	01.5	355 56.5	4.6	23 16.7	1.4	59.4
S 15	45 46.3	01.9	10 20.1	4.6	23 18.1	1.2	59.4
16	60 46.2	02.4	24 43.7	4.6	23 19.3	1.0	59.4
17	75 46.1	02.8	39 07.3	4.5	23 20.3	0.9	59.4
18	90 46.1	N21 03.3	53 30.8	4.5	N23 21.2	0.7	59.4
19	105 46.0	03.7	67 54.3	4.5	23 21.9	0.6	59.4
20	120 45.9	04.1	82 17.8	4.5	23 22.5	0.4	59.4
21	135 45.9	04.6	96 41.3	4.5	23 22.9	0.3	59.4
22	150 45.8	05.0	111 04.8	4.5	23 23.2	0.1	59.4
23	165 45.7	05.4	125 28.3	4.5	23 23.3	0.1	59.5
26 00	180 45.7	N21 05.9	139 51.8	4.4	N23 23.2	0.2	59.5
01	195 45.6	06.3	154 15.2	4.5	23 23.0	0.4	59.5
02	210 45.5	06.7	168 38.7	4.4	23 22.6	0.6	59.5
03	225 45.5	07.2	183 02.1	4.5	23 22.0	0.7	59.5
04	240 45.4	07.6	197 25.6	4.4	23 21.3	0.9	59.5
05	255 45.3	08.0	211 49.0	4.5	23 20.4	1.0	59.5
06	270 45.3	N21 08.5	226 12.5	4.5	N23 19.4	1.2	59.5
07	285 45.2	08.9	240 36.0	4.4	23 18.2	1.4	59.5
S 08	300 45.1	09.3	254 59.4	4.5	23 16.8	1.5	59.5
A 09	315 45.1	09.8	269 22.9	4.5	23 15.3	1.7	59.5
B 10	330 45.0	10.2	283 46.4	4.5	23 13.6	1.8	59.5
A 11	345 44.9	10.6	298 09.9	4.5	23 11.8	2.0	59.5
D 12	0 44.9	N21 11.1	312 33.4	4.6	N23 09.8	2.2	59.5
O 13	15 44.8	11.5	326 57.0	4.5	23 07.6	2.3	59.5
14	30 44.7	11.9	341 20.5	4.6	23 05.3	2.5	59.5
15	45 44.6	12.3	355 44.1	4.6	23 02.8	2.6	59.5
16	60 44.6	12.8	10 07.7	4.6	23 00.2	2.8	59.6
17	75 44.5	13.2	24 31.3	4.7	22 57.4	3.0	59.6
18	90 44.4	N21 13.6	38 55.0	4.6	N22 54.4	3.1	59.6
19	105 44.4	14.0	53 18.6	4.7	22 51.3	3.3	59.6
20	120 44.3	14.5	67 42.3	4.8	22 48.0	3.4	59.6
21	135 44.2	14.9	82 06.1	4.7	22 44.6	3.6	59.6
22	150 44.1	15.3	96 29.8	4.8	22 41.0	3.7	59.6
23	165 44.1	15.7	110 53.6	4.9	22 37.3	3.9	59.6
27 00	180 44.0	N21 16.2	125 17.5	4.9	N22 33.4	4.0	59.6
01	195 43.9	16.6	139 41.4	4.9	22 29.4	4.2	59.6
02	210 43.9	17.0	154 05.3	4.9	22 25.2	4.4	59.6
03	225 43.8	17.4	168 29.2	5.0	22 20.8	4.4	59.6
04	240 43.7	17.8	182 53.2	5.1	22 16.4	4.7	59.6
05	255 43.6	18.2	197 17.3	5.1	22 11.7	4.8	59.6
06	270 43.6	N21 18.7	211 41.4	5.1	N22 06.9	4.9	59.6
07	285 43.5	19.1	226 05.5	5.2	22 02.0	5.1	59.6
D 08	300 43.4	19.5	240 29.7	5.2	21 56.9	5.3	59.6
O 09	315 43.3	19.9	254 53.9	5.3	21 51.6	5.4	59.6
M 10	330 43.3	20.3	269 18.2	5.3	21 46.2	5.5	59.6
I 11	345 43.2	20.7	283 42.5	5.4	21 40.7	5.7	59.6
N 12	0 43.1	N21 21.2	298 06.9	5.4	N21 35.0	5.8	59.6
G 13	15 43.0	21.6	312 31.3	5.5	21 29.2	5.9	59.6
O 14	30 43.0	22.0	326 55.8	5.6	21 23.3	6.1	59.6
15	45 42.9	22.4	341 20.4	5.6	21 17.2	6.3	59.6
16	60 42.8	22.8	355 45.0	5.6	21 10.9	6.4	59.6
17	75 42.7	23.2	10 09.6	5.8	21 04.5	6.5	59.6
18	90 42.7	N21 23.6	24 34.4	5.8	N20 58.0	6.6	59.6
19	105 42.6	24.0	38 59.2	5.8	20 51.4	6.8	59.6
20	120 42.5	24.4	53 24.0	5.9	20 44.6	7.0	59.6
21	135 42.4	24.8	67 48.9	6.0	20 37.6	7.0	59.6
22	150 42.4	25.3	82 13.9	6.0	20 30.6	7.2	59.6
23	165 42.3	25.7	96 38.9	6.1	N20 23.4	7.3	59.6
	SD 15.8	d 0.4	SD 16.2		16.2		16.2

Lat.	Crepúsculo Náutico	Crepúsculo Civil	Orto Sol	Orto Luna 25	Orto Luna 26	Orto Luna 27	Orto Luna 28
°	h m	h m	h m	h m	h m	h m	h m
N 72	▭	▭	▭	▭	▭	▭	▭
N 70	▭	▭	▭	▭	▭	▭	05 50
68	////	////	00 16	▭	▭	▭	06 53
66	////	////	01 37	03 10	03 53	05 32	07 28
64	////	////	02 14	03 55	04 47	06 11	07 53
62	////	00 58	02 39	04 25	05 19	06 38	08 13
60	////	01 44	02 59	04 47	05 43	06 59	08 29
N 58	////	02 13	03 16	05 06	06 03	07 17	08 43
56	00 53	02 34	03 29	05 21	06 19	07 31	08 54
54	01 35	02 52	03 41	05 34	06 32	07 44	09 04
52	02 01	03 07	03 52	05 46	06 44	07 55	09 13
50	02 22	03 19	04 01	05 56	06 55	08 05	09 21
45	02 59	03 45	04 21	06 18	07 17	08 25	09 38
N 40	03 25	04 05	04 36	06 36	07 35	08 42	09 52
35	03 46	04 21	04 50	06 50	07 50	08 56	10 04
30	04 02	04 34	05 01	07 03	08 03	09 08	10 14
20	04 28	04 57	05 21	07 25	08 26	09 29	10 32
N 10	04 48	05 15	05 38	07 45	08 45	09 47	10 47
0	05 05	05 31	05 53	08 02	09 03	10 04	11 02
S 10	05 21	05 47	06 09	08 20	09 21	10 20	11 16
20	05 35	06 02	06 26	08 40	09 41	10 38	11 31
30	05 49	06 19	06 44	09 02	10 03	10 59	11 49
35	05 57	06 28	06 55	09 15	10 16	11 11	11 59
40	06 05	06 38	07 08	09 30	10 31	11 25	12 10
45	06 13	06 50	07 23	09 48	10 49	11 41	12 24
S 50	06 23	07 04	07 41	10 11	11 12	12 01	12 40
52	06 28	07 10	07 49	10 22	11 23	12 11	12 48
54	06 32	07 17	07 59	10 34	11 35	12 21	12 56
56	06 37	07 25	08 09	10 48	11 48	12 34	13 06
58	06 43	07 33	08 22	11 04	12 05	12 47	13 17
S 60	06 49	07 43	08 36	11 24	12 24	13 04	13 29

Lat.	Ocaso Sol	Crepúsculo Civil	Crepúsculo Náutico	Ocaso Luna 25	Ocaso Luna 26	Ocaso Luna 27	Ocaso Luna 28
°	h m	h m	h m	h m	h m	h m	h m
N 72	▭	▭	▭	▭	▭	▭	▭
N 70	▭	▭	▭	▭	▭	▭	03 57
68	▭	▭	▭	▭	▭	▭	02 53
66	22 20	////	////	00 19	01 43	02 11	02 17
64	21 43	////	////	24 49	00 49	01 31	01 51
62	21 17	23 01	////	24 16	00 16	01 04	01 31
60	20 56	22 13	////	23 52	24 42	00 42	01 14
N 58	20 40	21 43	////	23 33	24 24	00 24	01 00
56	20 26	21 21	23 07	23 17	24 10	00 10	00 48
54	20 14	21 03	22 22	23 03	23 57	24 38	00 38
52	20 03	20 48	21 54	22 51	23 46	24 28	00 28
50	19 54	20 36	21 34	22 40	23 36	24 20	00 20
45	19 34	20 10	20 56	22 18	23 14	24 01	00 01
N 40	19 18	19 50	20 30	22 00	22 57	23 47	24 28
35	19 05	19 34	20 09	21 45	22 43	23 34	24 18
30	18 53	19 20	19 52	21 32	22 30	23 23	24 10
20	18 33	18 58	19 26	21 09	22 09	23 04	23 54
N 10	18 16	18 39	19 06	20 50	21 50	22 47	23 41
0	18 01	18 23	18 49	20 31	21 32	22 32	23 28
S 10	17 45	18 07	18 33	20 13	21 15	22 16	23 16
20	17 28	17 52	18 19	19 54	20 56	21 59	23 02
30	17 09	17 35	18 05	19 31	20 34	21 39	22 46
35	16 58	17 26	17 57	19 18	20 21	21 28	22 37
40	16 46	17 16	17 49	19 03	20 06	21 15	22 26
45	16 31	17 04	17 40	18 44	19 48	20 59	22 14
S 50	16 13	16 50	17 30	18 22	19 26	20 40	21 59
52	16 05	16 44	17 26	18 11	19 16	20 31	21 52
54	15 55	16 37	17 21	17 59	19 04	20 20	21 44
56	15 44	16 29	17 16	17 45	18 50	20 09	21 35
58	15 32	16 20	17 11	17 28	18 34	19 55	21 24
S 60	15 18	16 11	17 05	17 08	18 15	19 39	21 13

Día	SOL E.T. (+) 00h	SOL E.T. (+) 12h	SOL Pas. Mer.	LUNA Pas. Sup.	LUNA Mer. Inf.	LUNA Edad	LUNA Fase
d	m s	m s	h m	h m	h m	d	%
25	03 09	03 06	11 57	14 17	01 47	02	7
26	03 03	03 00	11 57	15 18	02 47	03	14
27	02 56	02 53	11 57	16 18	03 48	04	23

T.U.	ARIES	VENUS −4.4			MARTE −2.0			JUPITER −1.9			SATURNO +0.1		
	A.H.G.	A.H.G.	Dec.		A.H.G.	Dec.		A.H.G.	Dec.		A.H.G.	Dec.	
d h	° ′	° ′	° ′		° ′	° ′		° ′	° ′		° ′	° ′	
28 00	245 36.0	225 05.7	N 6	40.6	338 30.9	S25	39.1	167 00.6	N22	40.6	182 33.0	N19	24.5
01	260 38.5	240 06.0		41.2	353 34.0		39.2	182 02.5		40.6	197 35.2		24.6
02	275 41.0	255 06.4		41.8	8 37.0		39.4	197 04.3		40.7	212 37.3		24.6
03	290 43.4	270 06.8	. .	42.5	23 40.0	. .	39.5	212 06.2	. .	40.7	227 39.4	. .	24.7
04	305 45.9	285 07.2		43.1	38 43.1		39.7	227 08.0		40.7	242 41.6		24.7
05	320 48.3	300 07.5		43.7	53 46.1		39.8	242 09.9		40.8	257 43.7		24.8
06	335 50.8	315 07.9	N 6	44.3	68 49.1	S25	40.0	257 11.7	N22	40.8	272 45.8	N19	24.9
07	350 53.3	330 08.3		45.0	83 52.2		40.1	272 13.6		40.9	287 47.9		24.9
08	5 55.7	345 08.6		45.6	98 55.2		40.3	287 15.4		40.9	302 50.1		25.0
L 09	20 58.2	0 09.0	. .	46.2	113 58.3	. .	40.4	302 17.3	. .	41.0	317 52.2	. .	25.0
U 10	36 00.7	15 09.4		46.9	129 01.3		40.6	317 19.1		41.0	332 54.3		25.1
11	51 03.1	30 09.7		47.5	144 04.3		40.7	332 21.0		41.1	347 56.4		25.2
N 12	66 05.6	45 10.1	N 6	48.1	159 07.4	S25	40.9	347 22.8	N22	41.1	2 58.6	N19	25.2
E 13	81 08.1	60 10.5		48.8	174 10.4		41.0	2 24.7		41.2	18 00.7		25.3
14	96 10.5	75 10.8		49.4	189 13.5		41.2	17 26.5		41.2	33 02.8		25.3
S 15	111 13.0	90 11.2	. .	50.1	204 16.5	. .	41.3	32 28.3	. .	41.3	48 04.9	. .	25.4
16	126 15.4	105 11.6		50.7	219 19.6		41.5	47 30.2		41.3	63 07.1		25.5
17	141 17.9	120 11.9		51.3	234 22.6		41.6	62 32.0		41.4	78 09.2		25.5
18	156 20.4	135 12.3	N 6	52.0	249 25.7	S25	41.8	77 33.9	N22	41.4	93 11.3	N19	25.6
19	171 22.8	150 12.6		52.6	264 28.7		41.9	92 35.7		41.5	108 13.5		25.6
20	186 25.3	165 13.0		53.2	279 31.8		42.1	107 37.6		41.5	123 15.6		25.7
21	201 27.8	180 13.3	. .	53.9	294 34.8	. .	42.2	122 39.4	. .	41.6	138 17.7	. .	25.8
22	216 30.2	195 13.7		54.5	309 37.9		42.4	137 41.3		41.6	153 19.8		25.8
23	231 32.7	210 14.1		55.2	324 40.9		42.5	152 43.1		41.7	168 22.0		25.9
29 00	246 35.2	225 14.4	N 6	55.8	339 44.0	S25	42.7	167 45.0	N22	41.7	183 24.1	N19	25.9
01	261 37.6	240 14.8		56.4	354 47.1		42.8	182 46.8		41.8	198 26.2		26.0
02	276 40.1	255 15.1		57.1	9 50.1		43.0	197 48.7		41.8	213 28.3		26.1
03	291 42.6	270 15.5	. .	57.7	24 53.2	. .	43.1	212 50.5	. .	41.9	228 30.5	. .	26.1
04	306 45.0	285 15.8		58.4	39 56.2		43.3	227 52.4		41.9	243 32.6		26.2
05	321 47.5	300 16.2		59.0	54 59.3		43.4	242 54.2		42.0	258 34.7		26.2
06	336 49.9	315 16.5	N 6	59.6	70 02.4	S25	43.5	257 56.0	N22	42.0	273 36.9	N19	26.3
07	351 52.4	330 16.9	7	00.3	85 05.4		43.7	272 57.9		42.1	288 39.0		26.4
M 08	6 54.9	345 17.2		00.9	100 08.5		43.8	287 59.7		42.1	303 41.1		26.4
A 09	21 57.3	0 17.6	. .	01.6	115 11.6	. .	44.0	303 01.6	. .	42.2	318 43.2	. .	26.5
R 10	36 59.8	15 17.9		02.2	130 14.7		44.1	318 03.4		42.2	333 45.4		26.5
11	52 02.3	30 18.2		02.9	145 17.7		44.3	333 05.3		42.3	348 47.5		26.6
T 12	67 04.7	45 18.6	N 7	03.5	160 20.8	S25	44.4	348 07.1	N22	42.3	3 49.6	N19	26.7
13	82 07.2	60 18.9		04.2	175 23.9		44.6	3 09.0		42.4	18 51.7		26.7
E 14	97 09.7	75 19.3		04.8	190 27.0		44.7	18 10.8		42.4	33 53.9		26.8
15	112 12.1	90 19.6	. .	05.5	205 30.0	. .	44.9	33 12.7	. .	42.4	48 56.0	. .	26.8
S 16	127 14.6	105 20.0		06.1	220 33.1		45.0	48 14.5		42.5	63 58.1		26.9
17	142 17.1	120 20.3		06.8	235 36.2		45.2	63 16.4		42.5	79 00.3		27.0
18	157 19.5	135 20.6	N 7	07.4	250 39.3	S25	45.3	78 18.2	N22	42.6	94 02.4	N19	27.0
19	172 22.0	150 21.0		08.1	265 42.4		45.5	93 20.0		42.6	109 04.5		27.1
20	187 24.4	165 21.3		08.7	280 45.4		45.6	108 21.9		42.7	124 06.6		27.1
21	202 26.9	180 21.6	. .	09.4	295 48.5	. .	45.8	123 23.7	. .	42.7	139 08.8	. .	27.2
22	217 29.4	195 22.0		10.0	310 51.6		45.9	138 25.6		42.8	154 10.9		27.3
23	232 31.8	210 22.3		10.7	325 54.7		46.0	153 27.4		42.8	169 13.0		27.3
30 00	247 34.3	225 22.6	N 7	11.3	340 57.8	S25	46.2	168 29.3	N22	42.9	184 15.1	N19	27.4
01	262 36.8	240 23.0		12.0	356 00.9		46.3	183 31.1		42.9	199 17.3		27.4
02	277 39.2	255 23.3		12.6	11 04.0		46.5	198 33.0		43.0	214 19.4		27.5
03	292 41.7	270 23.6	. .	13.3	26 07.1	. .	46.6	213 34.8	. .	43.0	229 21.5	. .	27.6
04	307 44.2	285 24.0		13.9	41 10.2		46.8	228 36.7		43.1	244 23.7		27.6
05	322 46.6	300 24.3		14.6	56 13.2		46.9	243 38.5		43.1	259 25.8		27.7
06	337 49.1	315 24.6	N 7	15.2	71 16.3	S25	47.1	258 40.3	N22	43.2	274 27.9	N19	27.7
M 07	352 51.5	330 24.9		15.9	86 19.4		47.2	273 42.2		43.2	289 30.0		27.8
I 08	7 54.0	345 25.3		16.5	101 22.5		47.4	288 44.0		43.3	304 32.2		27.9
E 09	22 56.5	0 25.6	. .	17.2	116 25.6	. .	47.5	303 45.9	. .	43.3	319 34.3	. .	27.9
R 10	37 58.9	15 25.9		17.8	131 28.7		47.7	318 47.7		43.4	334 36.4		28.0
C 11	53 01.4	30 26.2		18.5	146 31.8		47.8	333 49.6		43.4	349 38.5		28.0
O 12	68 03.9	45 26.6	N 7	19.2	161 34.9	S25	47.9	348 51.4	N22	43.4	4 40.7	N19	28.1
L 13	83 06.3	60 26.9		19.8	176 38.0		48.1	3 53.3		43.5	19 42.8		28.2
E 14	98 08.8	75 27.2		20.5	191 41.2		48.2	18 55.1		43.5	34 44.9		28.2
S 15	113 11.3	90 27.5	. .	21.1	206 44.3	. .	48.4	33 57.0	. .	43.6	49 47.1	. .	28.3
16	128 13.7	105 27.8		21.8	221 47.4		48.5	48 58.8		43.6	64 49.2		28.3
17	143 16.2	120 28.1		22.5	236 50.5		48.7	64 00.6		43.7	79 51.3		28.4
18	158 18.7	135 28.5	N 7	23.1	251 53.6	S25	48.8	79 02.5	N22	43.7	94 53.4	N19	28.5
19	173 21.1	150 28.8		23.8	266 56.7		49.0	94 04.3		43.8	109 55.6		28.5
20	188 23.6	165 29.1		24.4	281 59.8		49.1	109 06.2		43.8	124 57.7		28.6
21	203 26.0	180 29.4	. .	25.1	297 02.9	. .	49.3	124 08.0	. .	43.9	139 59.8	. .	28.6
22	218 28.5	195 29.7		25.8	312 06.0		49.4	139 09.9		43.9	155 01.9		28.7
23	233 31.0	210 30.0		26.4	327 09.2		49.5	154 11.7		44.0	170 04.1		28.8
Pas. Mer.	h m 7 32.4	*v* 0.3	*d*	0.6	*v* 3.1	*d*	0.1	*v* 1.8	*d*	0.0	*v* 2.1	*d*	0.1

ESTRELLAS

Nombre	A.H.S.		Dec.	
	° ′		° ′	
Acamar	315 25.9	S40	18.0	
Achernar	335 34.2	S57	13.7	
Acrux	173 19.7	S63	06.6	
Adhara	255 20.3	S28	58.6	
Aldebaran	291 00.6	N16	30.6	
Alioth	166 28.6	N55	57.5	
Alkaid	153 05.9	N49	18.6	
Al Na'ir	27 55.5	S46	57.1	
Alnilam	275 56.3	S 1	12.2	
Alphard	218 05.5	S 8	39.9	
Alphecca	126 18.7	N26	42.7	
Alpheratz	357 53.5	N29	05.6	
Altair	62 17.2	N 8	52.2	
Ankaa	353 25.2	S42	17.9	
Antares	112 37.5	S26	26.1	
Arcturus	146 04.1	N19	10.6	
Atria	107 47.4	S69	01.8	
Avior	234 22.3	S59	31.1	
Bellatrix	278 42.5	N 6	21.0	
Betelgeuse	271 11.9	N 7	24.4	
Canopus	264 00.9	S52	42.0	
Capella	280 49.0	N45	59.9	
Deneb	49 37.7	N45	16.8	
Denebola	182 43.2	N14	34.0	
Diphda	349 05.6	S17	58.8	
Dubhe	194 03.1	N61	45.0	
Elnath	278 25.0	N28	36.5	
Eltanin	90 50.0	N51	29.2	
Enif	33 56.3	N 9	52.7	
Fomalhaut	15 34.4	S29	36.9	
Gacrux	172 11.3	S57	07.4	
Gienah	176 01.9	S17	33.0	
Hadar	149 01.0	S60	22.9	
Hamal	328 11.8	N23	27.9	
Kaus Aust	83 56.0	S34	23.0	
Kochab	137 18.4	N74	09.2	
Markab	13 47.8	N15	12.5	
Menkar	314 25.3	N 4	05.5	
Menkent	148 18.5	S36	22.7	
Miaplacidus	221 42.1	S69	43.6	
Mirfak	308 54.5	N49	51.8	
Nunki	76 09.7	S26	17.7	
Peacock	53 33.7	S56	43.7	
Pollux	243 39.6	N28	01.5	
Procyon	245 09.9	N 5	13.3	
Rasalhague	96 14.9	N12	33.5	
Regulus	207 53.6	N11	57.7	
Rigel	281 21.5	S 8	12.1	
Rigil Kent.	140 04.3	S60	50.5	
Sabik	102 23.1	S15	43.6	
Schedar	349 51.8	N56	32.3	
Shaula	96 34.4	S37	06.2	
Sirius	258 42.4	S16	43.2	
Spica	158 41.0	S11	10.1	
Suhail	222 59.6	S43	26.5	
Vega	80 45.0	N38	47.0	
Zuben'ubi	137 15.6	S16	02.8	

	A.H.S.		Pas. Mer.	
	° ′		h	m
Venus	338 39.2		8	59
Marte	93 08.8		1	21
Júpiter	281 09.8		12	47
Saturno	296 48.9		11	45

T.U.	SOL				LUNA					
	A.H.G.		Dec.		A.H.G.	v	Dec.	d	P.H.	
d h	°	′	°	′	°	′	′	°	′	′	′
LUNES 28 00	180	42.2	N21	26.1	111	04.0	6.2	N20	16.1	7.5	59.5
01	195	42.1		26.5	125	29.2	6.2	20	08.6	7.6	59.5
02	210	42.1		26.9	139	54.4	6.4	20	01.0	7.7	59.5
03	225	42.0	. .	27.3	154	19.8	6.3	19	53.3	7.8	59.5
04	240	41.9		27.7	168	45.1	6.5	19	45.5	8.0	59.5
05	255	41.8		28.1	183	10.6	6.5	19	37.5	8.1	59.5
06	270	41.7	N21	28.5	197	36.1	6.6	N19	29.4	8.2	59.5
07	285	41.7		28.9	212	01.7	6.6	19	21.2	8.3	59.5
08	300	41.6		29.3	226	27.3	6.7	19	12.9	8.5	59.5
09	315	41.5	. .	29.7	240	53.0	6.8	19	04.4	8.6	59.5
10	330	41.4		30.1	255	18.8	6.9	18	55.8	8.7	59.5
11	345	41.4		30.5	269	44.7	6.9	18	47.1	8.8	59.5
12	0	41.3	N21	30.9	284	10.6	7.0	N18	38.3	8.9	59.5
13	15	41.2		31.3	298	36.6	7.1	18	29.4	9.0	59.5
14	30	41.1		31.7	313	02.7	7.2	18	20.4	9.2	59.5
15	45	41.0	. .	32.1	327	28.9	7.2	18	11.2	9.2	59.5
16	60	41.0		32.5	341	55.1	7.3	18	02.0	9.4	59.5
17	75	40.9		32.9	356	21.4	7.4	17	52.6	9.5	59.5
18	90	40.8	N21	33.2	10	47.8	7.4	N17	43.1	9.6	59.5
19	105	40.7		33.6	25	14.2	7.5	17	33.5	9.7	59.4
20	120	40.6		34.0	39	40.7	7.6	17	23.8	9.8	59.4
21	135	40.6	. .	34.4	54	07.3	7.7	17	14.0	9.9	59.4
22	150	40.5		34.8	68	34.0	7.8	17	04.1	10.0	59.4
23	165	40.4		35.2	83	00.8	7.8	16	54.1	10.1	59.4
MARTES 29 00	180	40.3	N21	35.6	97	27.6	7.9	N16	44.0	10.2	59.4
01	195	40.2		36.0	111	54.5	7.9	16	33.8	10.2	59.4
02	210	40.1		36.4	126	21.4	8.1	16	23.6	10.4	59.4
03	225	40.1	. .	36.8	140	48.5	8.1	16	13.2	10.5	59.4
04	240	40.0		37.1	155	15.6	8.2	16	02.7	10.6	59.4
05	255	39.9		37.5	169	42.8	8.2	15	52.1	10.7	59.4
06	270	39.8	N21	37.9	184	10.0	8.4	N15	41.4	10.7	59.4
07	285	39.7		38.3	198	37.4	8.4	15	30.7	10.9	59.3
08	300	39.6		38.7	213	04.8	8.4	15	19.8	10.9	59.3
09	315	39.6	. .	39.1	227	32.2	8.6	15	08.9	11.0	59.3
10	330	39.5		39.5	241	59.8	8.6	14	57.9	11.1	59.3
11	345	39.4		39.8	256	27.4	8.7	14	46.8	11.2	59.3
12	0	39.3	N21	40.2	270	55.1	8.8	N14	35.6	11.3	59.3
13	15	39.2		40.6	285	22.9	8.8	14	24.3	11.3	59.3
14	30	39.1		41.0	299	50.7	8.9	14	13.0	11.5	59.3
15	45	39.1	. .	41.4	314	18.6	9.0	14	01.5	11.5	59.3
16	60	39.0		41.7	328	46.6	9.0	13	50.0	11.6	59.3
17	75	38.9		42.1	343	14.6	9.2	13	38.4	11.6	59.2
18	90	38.8	N21	42.5	357	42.8	9.1	N13	26.8	11.8	59.2
19	105	38.7		42.9	12	10.9	9.3	13	15.0	11.8	59.2
20	120	38.6		43.3	26	39.2	9.3	13	03.2	11.8	59.2
21	135	38.6	. .	43.6	41	07.5	9.4	12	51.4	12.0	59.2
22	150	38.5		44.0	55	35.9	9.4	12	39.4	12.0	59.2
23	165	38.4		44.4	70	04.3	9.5	12	27.4	12.1	59.2
MIERCOLES 30 00	180	38.3	N21	44.8	84	32.8	9.6	N12	15.3	12.1	59.2
01	195	38.2		45.1	99	01.4	9.7	12	03.2	12.2	59.2
02	210	38.1		45.5	113	30.1	9.7	11	51.0	12.3	59.1
03	225	38.0	. .	45.9	127	58.8	9.7	11	38.7	12.3	59.1
04	240	38.0		46.2	142	27.5	9.9	11	26.4	12.4	59.1
05	255	37.9		46.6	156	56.4	9.9	11	14.0	12.4	59.1
06	270	37.8	N21	47.0	171	25.3	9.9	N11	01.6	12.5	59.1
07	285	37.7		47.4	185	54.2	10.0	10	49.1	12.6	59.1
08	300	37.6		47.7	200	23.2	10.1	10	36.5	12.6	59.1
09	315	37.5	. .	48.1	214	52.3	10.1	10	23.9	12.7	59.1
10	330	37.4		48.5	229	21.4	10.2	10	11.2	12.7	59.1
11	345	37.3		48.8	243	50.6	10.3	9	58.5	12.7	59.0
12	0	37.3	N21	49.2	258	19.9	10.3	N 9	45.8	12.8	59.0
13	15	37.2		49.6	272	49.2	10.3	9	33.0	12.9	59.0
14	30	37.1		49.9	287	18.5	10.5	9	20.1	12.9	59.0
15	45	37.0	. .	50.3	301	48.0	10.4	9	07.2	13.0	59.0
16	60	36.9		50.7	316	17.4	10.5	8	54.2	12.9	59.0
17	75	36.8		51.0	330	46.9	10.6	8	41.3	13.1	59.0
18	90	36.7	N21	51.4	345	16.5	10.6	N 8	28.2	13.0	58.9
19	105	36.6		51.7	359	46.1	10.7	8	15.2	13.2	58.9
20	120	36.5		52.1	14	15.8	10.7	8	02.0	13.1	58.9
21	135	36.5	. .	52.5	28	45.5	10.8	7	48.9	13.2	58.9
22	150	36.4		52.8	43	15.3	10.8	7	35.7	13.2	58.9
23	165	36.3		53.2	57	45.1	10.9	N 7	22.5	13.3	58.9
	SD	15.8	d	0.4	SD		16.2		16.2		16.1

Lat.	Crepúsculo Náutico	Crepúsculo Civil	Orto Sol	Orto Luna 28	Orto Luna 29	Orto Luna 30	Orto Luna 31
°	h m	h m	h m	h m	h m	h m	h m
N 72	▭	▭	▭	▭	08 02	10 34	12 45
N 70	▭	▭	▭	05 50	08 38	10 50	12 51
68	▭	▭	▭	06 53	09 04	11 03	12 56
66	////	////	01 25	07 28	09 24	11 14	13 00
64	////	////	02 05	07 53	09 39	11 23	13 03
62	////	00 38	02 33	08 13	09 52	11 31	13 06
60	////	01 35	02 54	08 29	10 03	11 37	13 09
N 58	////	02 06	03 11	08 43	10 13	11 43	13 11
56	00 35	02 29	03 25	08 54	10 21	11 48	13 13
54	01 26	02 48	03 38	09 04	10 28	11 53	13 15
52	01 55	03 03	03 49	09 13	10 35	11 57	13 17
50	02 17	03 16	03 58	09 21	10 41	12 00	13 18
45	02 56	03 42	04 18	09 38	10 54	12 08	13 22
N 40	03 23	04 03	04 35	09 52	11 04	12 15	13 24
35	03 44	04 19	04 48	10 04	11 13	12 21	13 27
30	04 01	04 33	05 00	10 14	11 21	12 26	13 29
20	04 27	04 56	05 20	10 32	11 34	12 34	13 33
N 10	04 48	05 15	05 38	10 47	11 46	12 42	13 36
0	05 06	05 32	05 54	11 02	11 57	12 49	13 39
S 10	05 21	05 47	06 10	11 16	12 08	12 56	13 42
20	05 36	06 03	06 27	11 31	12 19	13 04	13 45
30	05 51	06 20	06 46	11 49	12 33	13 12	13 49
35	05 58	06 30	06 57	11 59	12 40	13 17	13 51
40	06 07	06 40	07 10	12 10	12 49	13 22	13 53
45	06 16	06 52	07 25	12 24	12 59	13 29	13 56
S 50	06 26	07 07	07 44	12 40	13 11	13 37	13 59
52	06 31	07 13	07 53	12 48	13 17	13 40	14 00
54	06 35	07 20	08 03	12 56	13 23	13 44	14 02
56	06 41	07 28	08 14	13 06	13 30	13 48	14 04
58	06 46	07 37	08 26	13 17	13 37	13 53	14 06
S 60	06 53	07 48	08 41	13 29	13 46	13 58	14 08

Lat.	Ocaso Sol	Crepúsculo Civil	Crepúsculo Náutico	Ocaso Luna 28	Ocaso Luna 29	Ocaso Luna 30	Ocaso Luna 31
°	h m	h m	h m	h m	h m	h m	h m
N 72	▭	▭	▭	▭	03 44	03 03	02 37
N 70	▭	▭	▭	03 57	03 06	02 44	02 28
68	▭	▭	▭	02 53	02 39	02 29	02 21
66	22 34	////	////	02 17	02 18	02 17	02 15
64	21 52	////	////	01 51	02 01	02 06	02 09
62	21 24	23 25	////	01 31	01 47	01 58	02 05
60	21 02	22 23	////	01 14	01 35	01 50	02 01
N 58	20 45	21 50	////	01 00	01 25	01 43	01 57
56	20 30	21 27	23 28	00 48	01 16	01 37	01 54
54	20 18	21 08	22 31	00 38	01 08	01 32	01 51
52	20 07	20 53	22 01	00 28	01 01	01 27	01 49
50	19 57	20 40	21 39	00 20	00 54	01 22	01 46
45	19 37	20 13	21 00	00 01	00 40	01 13	01 41
N 40	19 21	19 52	20 33	24 28	00 28	01 04	01 36
35	19 07	19 36	20 11	24 18	00 18	00 57	01 33
30	18 55	19 22	19 54	24 10	00 10	00 51	01 29
20	18 35	18 59	19 28	23 54	24 40	00 40	01 23
N 10	18 17	18 40	19 07	23 41	24 31	00 31	01 18
0	18 01	18 23	18 49	23 28	24 22	00 22	01 13
S 10	17 45	18 08	18 34	23 16	24 13	00 13	01 08
20	17 28	17 52	18 19	23 02	24 03	00 03	01 02
30	17 09	17 34	18 04	22 46	23 52	24 56	00 56
35	16 57	17 25	17 56	22 37	23 45	24 52	00 52
40	16 44	17 14	17 48	22 26	23 38	24 48	00 48
45	16 29	17 02	17 39	22 14	23 29	24 43	00 43
S 50	16 10	16 48	17 28	21 59	23 19	24 38	00 38
52	16 02	16 41	17 24	21 52	23 14	24 35	00 35
54	15 52	16 34	17 19	21 44	23 08	24 32	00 32
56	15 41	16 26	17 14	21 35	23 02	24 29	00 29
58	15 28	16 17	17 08	21 24	22 55	24 25	00 25
S 60	15 13	16 07	17 01	21 13	22 48	24 21	00 21

Día	SOL E.T. (+) 00h	SOL E.T. (+) 12h	Pas. Mer.	LUNA Pas. Mer. Sup.	LUNA Pas. Mer. Inf.	Edad	Fase
d	m s	m s	h m	h m	h m	d	%
28	02 49	02 45	11 57	17 15	04 47	05	34
29	02 41	02 37	11 57	18 09	05 43	06	45
30	02 33	02 29	11 58	19 01	06 36	07	57

T.U.	ARIES	VENUS −4.4		MARTE −2.1		JUPITER −1.9		SATURNO +0.1	
	A.H.G.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
31 00	248 33.4	225 30.3	N 7 27.1	342 12.3	S25 49.7	169 13.6	N22 44.0	185 06.2	N19 28.8
01	263 35.9	240 30.6	27.7	357 15.4	49.8	184 15.4	44.1	200 08.3	28.9
02	278 38.4	255 31.0	28.4	12 18.5	50.0	199 17.2	44.1	215 10.4	28.9
03	293 40.8	270 31.3	. . 29.1	27 21.6	. . 50.1	214 19.1	. . 44.1	230 12.6	. . 29.0
04	308 43.3	285 31.6	29.7	42 24.8	50.3	229 20.9	44.2	245 14.7	29.0
05	323 45.8	300 31.9	30.4	57 27.9	50.4	244 22.8	44.2	260 16.8	29.1
06	338 48.2	315 32.2	N 7 31.1	72 31.0	S25 50.6	259 24.6	N22 44.3	275 19.0	N19 29.2
07	353 50.7	330 32.5	31.7	87 34.1	50.7	274 26.5	44.3	290 21.1	29.2
J 08	8 53.2	345 32.8	32.4	102 37.3	50.9	289 28.3	44.4	305 23.2	29.3
U 09	23 55.6	0 33.1	. . 33.1	117 40.4	. . 51.0	304 30.2	. . 44.4	320 25.3	. . 29.3
E 10	38 58.1	15 33.4	33.7	132 43.5	51.1	319 32.0	44.5	335 27.5	29.4
11	54 00.5	30 33.7	34.4	147 46.6	51.3	334 33.8	44.5	350 29.6	29.5
V 12	69 03.0	45 34.0	N 7 35.1	162 49.8	S25 51.4	349 35.7	N22 44.6	5 31.7	N19 29.5
13	84 05.5	60 34.3	35.7	177 52.9	51.6	4 37.5	44.6	20 33.9	29.6
E 14	99 07.9	75 34.6	36.4	192 56.0	51.7	19 39.4	44.7	35 36.0	29.6
15	114 10.4	90 34.9	. . 37.1	207 59.2	. . 51.9	34 41.2	. . 44.7	50 38.1	. . 29.7
S 16	129 12.9	105 35.2	37.7	223 02.3	52.0	49 43.1	44.7	65 40.2	29.8
17	144 15.3	120 35.5	38.4	238 05.5	52.1	64 44.9	44.8	80 42.4	29.8
18	159 17.8	135 35.8	N 7 39.1	253 08.6	S25 52.3	79 46.8	N22 44.8	95 44.5	N19 29.9
19	174 20.3	150 36.1	39.8	268 11.7	52.4	94 48.6	44.9	110 46.6	29.9
20	189 22.7	165 36.4	40.4	283 14.9	52.6	109 50.4	44.9	125 48.7	30.0
21	204 25.2	180 36.7	. . 41.1	298 18.0	. . 52.7	124 52.3	. . 45.0	140 50.9	. . 30.1
22	219 27.6	195 37.0	41.8	313 21.2	52.9	139 54.1	45.0	155 53.0	30.1
23	234 30.1	210 37.2	42.4	328 24.3	53.0	154 56.0	45.1	170 55.1	30.2
1 00	249 32.6	225 37.5	N 7 43.1	343 27.4	S25 53.1	169 57.8	N22 45.1	185 57.3	N19 30.2
01	264 35.0	240 37.8	43.8	358 30.6	53.3	184 59.7	45.2	200 59.4	30.3
02	279 37.5	255 38.1	44.5	13 33.7	53.4	200 01.5	45.2	216 01.5	30.3
03	294 40.0	270 38.4	. . 45.1	28 36.9	. . 53.6	215 03.4	. . 45.2	231 03.6	. . 30.4
04	309 42.4	285 38.7	45.8	43 40.0	53.7	230 05.2	45.3	246 05.8	30.5
05	324 44.9	300 39.0	46.5	58 43.2	53.9	245 07.0	45.3	261 07.9	30.5
06	339 47.4	315 39.3	N 7 47.2	73 46.3	S25 54.0	260 08.9	N22 45.4	276 10.0	N19 30.6
07	354 49.8	330 39.5	47.8	88 49.5	54.1	275 10.7	45.4	291 12.1	30.6
V 08	9 52.3	345 39.8	48.5	103 52.6	54.3	290 12.6	45.5	306 14.3	30.7
I 09	24 54.8	0 40.1	. . 49.2	118 55.8	. . 54.4	305 14.4	. . 45.5	321 16.4	. . 30.8
E 10	39 57.2	15 40.4	49.9	133 59.0	54.6	320 16.3	45.6	336 18.5	30.8
R 11	54 59.7	30 40.7	50.5	149 02.1	54.7	335 18.1	45.6	351 20.7	30.9
N 12	70 02.1	45 40.9	N 7 51.2	164 05.3	S25 54.9	350 19.9	N22 45.7	6 22.8	N19 30.9
E 13	85 04.6	60 41.2	51.9	179 08.4	55.0	5 21.8	45.7	21 24.9	31.0
S 14	100 07.1	75 41.5	52.6	194 11.6	55.1	20 23.6	45.7	36 27.0	31.1
15	115 09.5	90 41.8	. . 53.3	209 14.8	. . 55.3	35 25.5	. . 45.8	51 29.2	. . 31.1
16	130 12.0	105 42.0	53.9	224 17.9	55.4	50 27.3	45.8	66 31.3	31.2
17	145 14.5	120 42.3	54.6	239 21.1	55.6	65 29.2	45.9	81 33.4	31.2
18	160 16.9	135 42.6	N 7 55.3	254 24.3	S25 55.7	80 31.0	N22 45.9	96 35.5	N19 31.3
19	175 19.4	150 42.9	56.0	269 27.4	55.8	95 32.9	46.0	111 37.7	31.3
20	190 21.9	165 43.1	56.7	284 30.6	56.0	110 34.7	46.0	126 39.8	31.4
21	205 24.3	180 43.4	. . 57.3	299 33.8	. . 56.1	125 36.5	. . 46.1	141 41.9	. . 31.5
22	220 26.8	195 43.7	58.0	314 36.9	56.3	140 38.4	46.1	156 44.1	31.5
23	235 29.3	210 44.0	58.7	329 40.1	56.4	155 40.2	46.1	171 46.2	31.6
2 00	250 31.7	225 44.2	N 7 59.4	344 43.3	S25 56.6	170 42.1	N22 46.2	186 48.3	N19 31.6
01	265 34.2	240 44.5	8 00.1	359 46.4	56.7	185 43.9	46.2	201 50.4	31.7
02	280 36.6	255 44.8	00.8	14 49.6	56.8	200 45.8	46.3	216 52.6	31.8
03	295 39.1	270 45.0	. . 01.4	29 52.8	. . 57.0	215 47.6	. . 46.3	231 54.7	. . 31.8
04	310 41.6	285 45.3	02.1	44 56.0	57.1	230 49.4	46.4	246 56.8	31.9
05	325 44.0	300 45.6	02.8	59 59.1	57.3	245 51.3	46.4	261 59.0	31.9
06	340 46.5	315 45.8	N 8 03.5	75 02.3	S25 57.4	260 53.1	N22 46.5	277 01.1	N19 32.0
07	355 49.0	330 46.1	04.2	90 05.5	57.5	275 55.0	46.5	292 03.2	32.0
S 08	10 51.4	345 46.3	04.9	105 08.7	57.7	290 56.8	46.5	307 05.3	32.1
A 09	25 53.9	0 46.6	. . 05.5	120 11.9	. . 57.8	305 58.7	. . 46.6	322 07.5	. . 32.2
B 10	40 56.4	15 46.9	06.2	135 15.0	58.0	321 00.5	46.6	337 09.6	32.2
11	55 58.8	30 47.1	06.9	150 18.2	58.1	336 02.3	46.7	352 11.7	32.3
A 12	71 01.3	45 47.4	N 8 07.6	165 21.4	S25 58.2	351 04.2	N22 46.7	7 13.8	N19 32.3
13	86 03.7	60 47.6	08.3	180 24.6	58.4	6 06.0	46.8	22 16.0	32.4
D 14	101 06.2	75 47.9	09.0	195 27.8	58.5	21 07.9	46.8	37 18.1	32.5
15	116 08.7	90 48.2	. . 09.7	210 31.0	. . 58.7	36 09.7	. . 46.9	52 20.2	. . 32.5
O 16	131 11.1	105 48.4	10.4	225 34.2	58.8	51 11.6	46.9	67 22.4	32.6
17	146 13.6	120 48.7	11.0	240 37.4	58.9	66 13.4	46.9	82 24.5	32.6
18	161 16.1	135 48.9	N 8 11.7	255 40.5	S25 59.1	81 15.2	N22 47.0	97 26.6	N19 32.7
19	176 18.5	150 49.2	12.4	270 43.7	59.2	96 17.1	47.0	112 28.7	32.7
20	191 21.0	165 49.4	13.1	285 46.9	59.3	111 18.9	47.1	127 30.9	32.8
21	206 23.5	180 49.7	. . 13.8	300 50.1	. . 59.5	126 20.8	. . 47.1	142 33.0	. . 32.9
22	221 25.9	195 49.9	14.5	315 53.3	59.6	141 22.6	47.2	157 35.1	32.9
23	236 28.4	210 50.2	15.2	330 56.5	59.8	156 24.5	47.2	172 37.3	33.0
	h m								
Pas. Mer.	7 20.6	*v* 0.3	*d* 0.7	*v* 3.2	*d* 0.1	*v* 1.8	*d* 0.0	*v* 2.1	*d* 0.1

ESTRELLAS

Nombre	A.H.S.	Dec.
	° ′	° ′
Acamar	315 25.9	S40 18.0
Achernar	335 34.1	S57 13.7
Acrux	173 19.7	S63 06.6
Adhara	255 20.3	S28 58.6
Aldebaran	291 00.6	N16 30.6
Alioth	166 28.6	N55 57.5
Alkaid	153 05.9	N49 18.6
Al Na'ir	27 55.4	S46 57.1
Alnilam	275 56.3	S 1 12.2
Alphard	218 05.5	S 8 39.9
Alphecca	126 18.7	N26 42.7
Alpheratz	357 53.5	N29 05.6
Altair	62 17.2	N 8 52.2
Ankaa	353 25.2	S42 17.9
Antares	112 37.5	S26 26.1
Arcturus	146 04.1	N19 10.6
Atria	107 47.4	S69 01.8
Avior	234 22.3	S59 31.1
Bellatrix	278 42.5	N 6 21.0
Betelgeuse	271 11.9	N 7 24.4
Canopus	264 00.9	S52 41.9
Capella	280 49.0	N45 59.9
Deneb	49 37.7	N45 16.8
Denebola	182 43.2	N14 34.0
Diphda	349 05.5	S17 58.8
Dubhe	194 03.1	N61 45.0
Elnath	278 25.0	N28 36.5
Eltanin	90 50.0	N51 29.3
Enif	33 56.3	N 9 52.7
Fomalhaut	15 34.4	S29 36.9
Gacrux	172 11.3	S57 07.4
Gienah	176 02.0	S17 33.0
Hadar	149 01.0	S60 22.9
Hamal	328 11.8	N23 27.9
Kaus Aust.	83 56.0	S34 23.0
Kochab	137 18.4	N74 09.2
Markab	13 47.8	N15 12.5
Menkar	314 25.3	N 4 05.6
Menkent	148 18.5	S36 22.7
Miaplacidus	221 42.2	S69 43.6
Mirfak	308 54.5	N49 51.8
Nunki	76 09.7	S26 17.7
Peacock	53 33.7	S56 43.7
Pollux	243 39.6	N28 01.5
Procyon	245 09.9	N 5 13.3
Rasalhague	96 14.9	N12 33.5
Regulus	207 53.6	N11 57.7
Rigel	281 21.5	S 8 12.1
Rigil Kent.	140 04.3	S60 50.5
Sabik	102 23.1	S15 43.6
Schedar	349 51.7	N56 32.3
Shaula	96 34.4	S37 06.2
Sirius	258 42.4	S16 43.2
Spica	158 41.0	S11 10.1
Suhail	222 59.6	S43 26.5
Vega	80 45.0	N38 47.0
Zuben'ubi	137 15.6	S16 02.8

	A.H.S.	Pas. Mer.
	° ′	h m
Venus	336 05.0	8 57
Marte	93 54.9	1 06
Júpiter	280 25.2	12 39
Saturno	296 24.7	11 35

T.U.	SOL				LUNA						
	A.H.G.		Dec.		A.H.G.	v		Dec.		d	P.H.
d h	°	′	°	′	°	′	′	°	′	′	′
31 00	180	36.2	N21	53.5	72	15.0	10.9	N 7	09.2	13.3	58.9
01	195	36.1		53.9	86	44.9	11.0	6	55.9	13.3	58.9
02	210	36.0		54.3	101	14.9	11.0	6	42.6	13.3	58.8
03	225	35.9	. .	54.6	115	44.9	11.0	6	29.3	13.4	58.8
04	240	35.8		55.0	130	14.9	11.1	6	15.9	13.4	58.8
05	255	35.7		55.3	144	45.0	11.1	6	02.5	13.4	58.8
06	270	35.6	N21	55.7	159	15.1	11.2	N 5	49.1	13.5	58.8
07	285	35.6		56.0	173	45.3	11.2	5	35.6	13.5	58.8
J 08	300	35.5		56.4	188	15.5	11.2	5	22.1	13.5	58.8
U 09	315	35.4	. .	56.7	202	45.7	11.3	5	08.6	13.5	58.7
10	330	35.3		57.1	217	16.0	11.3	4	55.1	13.5	58.7
E 11	345	35.2		57.4	231	46.3	11.4	4	41.6	13.6	58.7
V 12	0	35.1	N21	57.8	246	16.7	11.4	N 4	28.0	13.5	58.7
13	15	35.0		58.1	260	47.1	11.4	4	14.5	13.6	58.7
E 14	30	34.9		58.5	275	17.5	11.5	4	00.9	13.6	58.7
15	45	34.8	. .	58.8	289	48.0	11.5	3	47.3	13.7	58.6
S 16	60	34.7		59.2	304	18.5	11.5	3	33.6	13.6	58.6
17	75	34.6		59.5	318	49.0	11.5	3	20.0	13.6	58.6
18	90	34.5	N21	59.9	333	19.5	11.6	N 3	06.4	13.7	58.6
19	105	34.4	22	00.2	347	50.1	11.6	2	52.7	13.6	58.6
20	120	34.4		00.6	2	20.7	11.6	2	39.1	13.7	58.6
21	135	34.3	. .	00.9	16	51.3	11.7	2	25.4	13.7	58.6
22	150	34.2		01.2	31	22.0	11.7	2	11.7	13.7	58.5
23	165	34.1		01.6	45	52.7	11.7	1	58.0	13.6	58.5
1 00	180	34.0	N22	01.9	60	23.4	11.7	N 1	44.4	13.7	58.5
01	195	33.9		02.3	74	54.1	11.8	1	30.7	13.7	58.5
02	210	33.8		02.6	89	24.9	11.7	1	17.0	13.7	58.5
03	225	33.7	. .	03.0	103	55.6	11.8	1	03.3	13.7	58.5
04	240	33.6		03.3	118	26.4	11.9	0	49.6	13.6	58.4
05	255	33.5		03.6	132	57.3	11.8	0	36.0	13.7	58.4
06	270	33.4	N22	04.0	147	28.1	11.8	N 0	22.3	13.7	58.4
07	285	33.3		04.3	161	58.9	11.9	N 0	08.6	13.7	58.4
V 08	300	33.2		04.6	176	29.8	11.9	S 0	05.1	13.6	58.4
I 09	315	33.1	. .	05.0	191	00.7	11.9	0	18.7	13.7	58.4
E 10	330	33.0		05.3	205	31.6	11.9	0	32.4	13.6	58.3
R 11	345	32.9		05.7	220	02.5	11.9	0	46.0	13.6	58.3
N 12	0	32.8	N22	06.0	234	33.4	12.0	S 0	59.6	13.7	58.3
E 13	15	32.7		06.3	249	04.4	11.9	1	13.3	13.6	58.3
S 14	30	32.6		06.7	263	35.3	12.0	1	26.9	13.5	58.3
15	45	32.6	. .	07.0	278	06.3	11.9	1	40.4	13.6	58.3
16	60	32.5		07.3	292	37.2	12.0	1	54.0	13.6	58.2
17	75	32.4		07.6	307	08.2	12.0	2	07.6	13.5	58.2
18	90	32.3	N22	08.0	321	39.2	12.0	S 2	21.1	13.5	58.2
19	105	32.2		08.3	336	10.2	12.0	2	34.6	13.5	58.2
20	120	32.1		08.6	350	41.2	12.0	2	48.1	13.5	58.2
21	135	32.0	. .	09.0	5	12.2	12.0	3	01.6	13.5	58.2
22	150	31.9		09.3	19	43.2	12.0	3	15.1	13.4	58.1
23	165	31.8		09.6	34	14.2	12.0	3	28.5	13.4	58.1
2 00	180	31.7	N22	09.9	48	45.2	12.0	S 3	41.9	13.4	58.1
01	195	31.6		10.3	63	16.2	12.0	3	55.3	13.4	58.1
02	210	31.5		10.6	77	47.2	12.0	4	08.7	13.3	58.1
03	225	31.4	. .	10.9	92	18.2	12.0	4	22.0	13.3	58.0
04	240	31.3		11.2	106	49.2	12.0	4	35.3	13.3	58.0
05	255	31.2		11.6	121	20.2	12.0	4	48.6	13.2	58.0
06	270	31.1	N22	11.9	135	51.2	12.0	S 5	01.8	13.2	58.0
07	285	31.0		12.2	150	22.2	12.0	5	15.0	13.2	58.0
S 08	300	30.9		12.5	164	53.2	12.0	5	28.2	13.1	58.0
A 09	315	30.8	. .	12.8	179	24.2	12.0	5	41.3	13.1	57.9
10	330	30.7		13.2	193	55.2	11.9	5	54.4	13.1	57.9
B 11	345	30.6		13.5	208	26.1	12.0	6	07.5	13.0	57.9
A 12	0	30.5	N22	13.8	222	57.1	12.0	S 6	20.5	13.0	57.9
13	15	30.4		14.1	237	28.1	11.9	6	33.5	13.0	57.9
D 14	30	30.3		14.4	251	59.0	12.0	6	46.5	12.9	57.8
15	45	30.2	. .	14.8	266	30.0	11.9	6	59.4	12.9	57.8
O 16	60	30.1		15.1	281	00.9	11.9	7	12.3	12.8	57.8
17	75	30.0		15.4	295	31.8	11.9	7	25.1	12.8	57.8
18	90	29.9	N22	15.7	310	02.7	11.9	S 7	37.9	12.7	57.8
19	105	29.8		16.0	324	33.6	11.9	7	50.6	12.7	57.7
20	120	29.7		16.3	339	04.5	11.8	8	03.3	12.6	57.7
21	135	29.6	. .	16.6	353	35.3	11.9	8	15.9	12.6	57.7
22	150	29.5		16.9	8	06.2	11.8	8	28.5	12.5	57.7
23	165	29.4		17.3	22	37.0	11.8	S 8	41.0	12.5	57.7
	SD	15.8	d	0.3	SD	16.0		15.9			15.8

Lat.	Crepúsculo Náutico	Crepúsculo Civil	Orto Sol	Orto Luna 31	Orto Luna 1	Orto Luna 2	Orto Luna 3
°	h m	h m	h m	h m	h m	h m	h m
N 72	▭	▭	▭	12 45	14 49	16 54	19 07
N 70	▭	▭	▭	12 51	14 47	16 42	18 42
68	▭	▭	▭	12 56	14 45	16 33	18 23
66	////	////	01 12	13 00	14 43	16 25	18 08
64	////	////	01 58	13 03	14 41	16 18	17 56
62	////	////	02 27	13 06	14 40	16 13	17 45
60	////	01 26	02 49	13 09	14 39	16 08	17 37
N 58	////	02 00	03 07	13 11	14 38	16 04	17 29
56	////	02 24	03 22	13 13	14 37	16 00	17 22
54	01 18	02 44	03 35	13 15	14 37	15 57	17 16
52	01 50	03 00	03 46	13 17	14 36	15 54	17 11
50	02 13	03 13	03 56	13 18	14 35	15 51	17 06
45	02 53	03 40	04 17	13 22	14 34	15 45	16 56
N 40	03 21	04 01	04 33	13 24	14 33	15 40	16 47
35	03 42	04 18	04 47	13 27	14 32	15 36	16 40
30	04 00	04 32	04 59	13 29	14 31	15 32	16 33
20	04 27	04 56	05 20	13 33	14 29	15 26	16 22
N 10	04 48	05 15	05 38	13 36	14 28	15 20	16 12
0	05 06	05 32	05 54	13 39	14 27	15 15	16 03
S 10	05 22	05 48	06 11	13 42	14 26	15 10	15 54
20	05 37	06 04	06 28	13 45	14 25	15 04	15 45
30	05 52	06 22	06 48	13 49	14 24	14 58	15 34
35	06 00	06 31	06 59	13 51	14 23	14 55	15 28
40	06 09	06 42	07 12	13 53	14 22	14 51	15 21
45	06 18	06 55	07 28	13 56	14 21	14 46	15 13
S 50	06 29	07 09	07 47	13 59	14 20	14 41	15 04
52	06 33	07 16	07 56	14 00	14 19	14 38	14 59
54	06 38	07 24	08 06	14 02	14 19	14 36	14 54
56	06 44	07 32	08 18	14 04	14 18	14 33	14 49
58	06 50	07 41	08 31	14 06	14 18	14 30	14 43
S 60	06 57	07 52	08 46	14 08	14 17	14 26	14 36

Lat.	Ocaso Sol	Crepúsculo Civil	Crepúsculo Náutico	Ocaso Luna 31	Ocaso Luna 1	Ocaso Luna 2	Ocaso Luna 3
°	h m	h m	h m	h m	h m	h m	h m
N 72	▭	▭	▭	02 37	02 16	01 56	01 33
N 70	▭	▭	▭	02 28	02 15	02 01	01 47
68	▭	▭	▭	02 21	02 13	02 06	01 58
66	22 48	////	////	02 15	02 12	02 10	02 08
64	22 00	////	////	02 09	02 12	02 13	02 16
62	21 30	////	////	02 05	02 11	02 16	02 22
60	21 08	22 32	////	02 01	02 10	02 19	02 28
N 58	20 50	21 57	////	01 57	02 10	02 21	02 34
56	20 35	21 32	////	01 54	02 09	02 23	02 39
54	20 22	21 13	22 40	01 51	02 09	02 25	02 43
52	20 10	20 57	22 07	01 49	02 08	02 27	02 47
50	20 00	20 43	21 44	01 46	02 08	02 29	02 50
45	19 40	20 16	21 04	01 41	02 07	02 32	02 58
N 40	19 23	19 55	20 35	01 36	02 06	02 35	03 04
35	19 09	19 38	20 14	01 33	02 05	02 37	03 10
30	18 56	19 24	19 56	01 29	02 05	02 40	03 15
20	18 36	19 00	19 29	01 23	02 04	02 43	03 23
N 10	18 18	18 41	19 08	01 18	02 03	02 47	03 31
0	18 01	18 24	18 50	01 13	02 02	02 50	03 38
S 10	17 45	18 08	18 34	01 08	02 01	02 53	03 45
20	17 28	17 51	18 19	01 02	02 00	02 56	03 53
30	17 08	17 34	18 03	00 56	01 59	03 00	04 01
35	16 56	17 24	17 55	00 52	01 58	03 02	04 06
40	16 43	17 13	17 47	00 48	01 57	03 05	04 12
45	16 27	17 01	17 37	00 43	01 56	03 08	04 19
S 50	16 08	16 46	17 27	00 38	01 55	03 11	04 27
52	15 59	16 39	17 22	00 35	01 55	03 13	04 31
54	15 49	16 32	17 17	00 32	01 54	03 15	04 35
56	15 38	16 23	17 11	00 29	01 53	03 17	04 39
58	15 24	16 14	17 05	00 25	01 53	03 19	04 44
S 60	15 09	16 04	16 59	00 21	01 52	03 21	04 50

Día	SOL E.T. (+) 00h	SOL E.T. (+) 12h	SOL Pas. Mer.	LUNA Pas. Sup.	LUNA Mer. Inf.	LUNA Edad	LUNA Fase
d	m s	m s	h m	h m	h m	d	%
31	02 25	02 21	11 58	19 50	07 26	08	63
1	02 16	02 12	11 58	20 39	08 14	09	73
2	02 07	02 02	11 58	21 27	09 02	10	86

T.U.	ARIES	VENUS −4.3		MARTE −2.1		JUPITER −1.9		SATURNO +0.1	
d h	A.H.G.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.
	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
3 00	251 30.9	225 50.4	N 8 15.9	345 59.7	S25 59.9	171 26.3	N22 47.3	187 39.4	N19 33.0
01	266 33.3	240 50.7	16.6	1 02.9	26 00.0	186 28.1	47.3	202 41.5	33.1
02	281 35.8	255 50.9	17.3	16 06.1	00.2	201 30.0	47.3	217 43.6	33.2
03	296 38.2	270 51.2	. . 17.9	31 09.3	. . 00.3	216 31.8	. . 47.4	232 45.8	. . 33.2
04	311 40.7	285 51.4	18.6	46 12.5	00.5	231 33.7	47.4	247 47.9	33.3
05	326 43.2	300 51.7	19.3	61 15.7	00.6	246 35.5	47.5	262 50.0	33.3
06	341 45.6	315 51.9	N 8 20.0	76 18.9	S26 00.7	261 37.4	N22 47.5	277 52.1	N19 33.4
07	356 48.1	330 52.1	20.7	91 22.1	00.9	276 39.2	47.6	292 54.3	33.4
08	11 50.6	345 52.4	21.4	106 25.3	01.0	291 41.0	47.6	307 56.4	33.5
D 09	26 53.0	0 52.6	. . 22.1	121 28.5	. . 01.1	306 42.9	. . 47.6	322 58.5	. . 33.6
O 10	41 55.5	15 52.9	22.8	136 31.7	01.3	321 44.7	47.7	338 00.7	33.6
M 11	56 58.0	30 53.1	23.5	151 34.9	01.4	336 46.6	47.7	353 02.8	33.7
I 12	72 00.4	45 53.4	N 8 24.2	166 38.2	S26 01.6	351 48.4	N22 47.8	8 04.9	N19 33.7
N 13	87 02.9	60 53.6	24.9	181 41.4	01.7	6 50.3	47.8	23 07.0	33.8
G 14	102 05.4	75 53.8	25.6	196 44.6	01.8	21 52.1	47.9	38 09.2	33.8
O 15	117 07.8	90 54.1	. . 26.3	211 47.8	. . 02.0	36 53.9	. . 47.9	53 11.3	. . 33.9
16	132 10.3	105 54.3	27.0	226 51.0	02.1	51 55.8	47.9	68 13.4	34.0
17	147 12.7	120 54.5	27.7	241 54.2	02.2	66 57.6	48.0	83 15.6	34.0
18	162 15.2	135 54.8	N 8 28.4	256 57.4	S26 02.4	81 59.5	N22 48.0	98 17.7	N19 34.1
19	177 17.7	150 55.0	29.1	272 00.7	02.5	97 01.3	48.1	113 19.8	34.1
20	192 20.1	165 55.2	29.8	287 03.9	02.6	112 03.2	48.1	128 21.9	34.2
21	207 22.6	180 55.5	. . 30.5	302 07.1	. . 02.8	127 05.0	. . 48.2	143 24.1	. . 34.2
22	222 25.1	195 55.7	31.2	317 10.3	02.9	142 06.8	48.2	158 26.2	34.3
23	237 27.5	210 55.9	31.9	332 13.5	03.1	157 08.7	48.2	173 28.3	34.4
4 00	252 30.0	225 56.2	N 8 32.6	347 16.7	S26 03.2	172 10.5	N22 48.3	188 30.5	N19 34.4
01	267 32.5	240 56.4	33.3	2 20.0	03.3	187 12.4	48.3	203 32.6	34.5
02	282 34.9	255 56.6	34.0	17 23.2	03.5	202 14.2	48.4	218 34.7	34.5
03	297 37.4	270 56.8	. . 34.7	32 26.4	. . 03.6	217 16.0	. . 48.4	233 36.8	. . 34.6
04	312 39.8	285 57.1	35.4	47 29.6	03.7	232 17.9	48.5	248 39.0	34.7
05	327 42.3	300 57.3	36.1	62 32.9	03.9	247 19.7	48.5	263 41.1	34.7
06	342 44.8	315 57.5	N 8 36.8	77 36.1	S26 04.0	262 21.6	N22 48.5	278 43.2	N19 34.8
07	357 47.2	330 57.7	37.5	92 39.3	04.1	277 23.4	48.6	293 45.4	34.8
L 08	12 49.7	345 58.0	38.2	107 42.6	04.3	292 25.3	48.6	308 47.5	34.9
U 09	27 52.2	0 58.2	. . 38.9	122 45.8	. . 04.4	307 27.1	. . 48.7	323 49.6	. . 34.9
N 10	42 54.6	15 58.4	39.6	137 49.0	04.5	322 28.9	48.7	338 51.7	35.0
E 11	57 57.1	30 58.6	40.3	152 52.2	04.7	337 30.8	48.8	353 53.9	35.1
S 12	72 59.6	45 58.8	N 8 41.0	167 55.5	S26 04.8	352 32.6	N22 48.8	8 56.0	N19 35.1
13	88 02.0	60 59.1	41.7	182 58.7	04.9	7 34.5	48.8	23 58.1	35.2
14	103 04.5	75 59.3	42.4	198 01.9	05.1	22 36.3	48.9	39 00.2	35.2
15	118 07.0	90 59.5	. . 43.1	213 05.2	. . 05.2	37 38.1	. . 48.9	54 02.4	. . 35.3
16	133 09.4	105 59.7	43.8	228 08.4	05.3	52 40.0	49.0	69 04.5	35.3
17	148 11.9	120 59.9	44.5	243 11.7	05.5	67 41.8	49.0	84 06.6	35.4
18	163 14.3	136 00.1	N 8 45.2	258 14.9	S26 05.6	82 43.7	N22 49.0	99 08.8	N19 35.5
19	178 16.8	151 00.3	45.9	273 18.1	05.7	97 45.5	49.1	114 10.9	35.5
20	193 19.3	166 00.6	46.6	288 21.4	05.9	112 47.4	49.1	129 13.0	35.6
21	208 21.7	181 00.8	. . 47.3	303 24.6	. . 06.0	127 49.2	. . 49.2	144 15.1	. . 35.6
22	223 24.2	196 01.0	48.0	318 27.9	06.1	142 51.0	49.2	159 17.3	35.7
23	238 26.7	211 01.2	48.7	333 31.1	06.3	157 52.9	49.3	174 19.4	35.7
5 00	253 29.1	226 01.4	N 8 49.4	348 34.3	S26 06.4	172 54.7	N22 49.3	189 21.5	N19 35.8
01	268 31.6	241 01.6	50.1	3 37.6	06.5	187 56.6	49.3	204 23.7	35.9
02	283 34.1	256 01.8	50.8	18 40.8	06.7	202 58.4	49.4	219 25.8	35.9
03	298 36.5	271 02.0	. . 51.5	33 44.1	. . 06.8	218 00.2	. . 49.4	234 27.9	. . 36.0
04	313 39.0	286 02.2	52.2	48 47.3	06.9	233 02.1	49.5	249 30.0	36.0
05	328 41.5	301 02.4	53.0	63 50.6	07.1	248 03.9	49.5	264 32.2	36.1
06	343 43.9	316 02.6	N 8 53.7	78 53.8	S26 07.2	263 05.8	N22 49.5	279 34.3	N19 36.1
07	358 46.4	331 02.8	54.4	93 57.1	07.3	278 07.6	49.6	294 36.4	36.2
M 08	13 48.8	346 03.0	55.1	109 00.3	07.5	293 09.5	49.6	309 38.6	36.3
A 09	28 51.3	1 03.2	. . 55.8	124 03.6	. . 07.6	308 11.3	. . 49.7	324 40.7	. . 36.3
R 10	43 53.8	16 03.4	56.5	139 06.8	07.7	323 13.1	49.7	339 42.8	36.4
T 11	58 56.2	31 03.6	57.2	154 10.1	07.8	338 15.0	49.7	354 44.9	36.4
E 12	73 58.7	46 03.8	N 8 57.9	169 13.3	S26 08.0	353 16.8	N22 49.8	9 47.1	N19 36.5
S 13	89 01.2	61 04.0	58.6	184 16.6	08.1	8 18.7	49.8	24 49.2	36.5
14	104 03.6	76 04.2	8 59.3	199 19.9	08.2	23 20.5	49.9	39 51.3	36.6
15	119 06.1	91 04.4	9 00.0	214 23.1	. . 08.4	38 22.3	. . 49.9	54 53.5	. . 36.7
16	134 08.6	106 04.6	00.8	229 26.4	08.5	53 24.2	50.0	69 55.6	36.7
17	149 11.0	121 04.8	01.5	244 29.6	08.6	68 26.0	50.0	84 57.7	36.8
18	164 13.5	136 05.0	N 9 02.2	259 32.9	S26 08.8	83 27.9	N22 50.0	99 59.9	N19 36.8
19	179 16.0	151 05.2	02.9	274 36.2	08.9	98 29.7	50.1	115 02.0	36.9
20	194 18.4	166 05.4	03.6	289 39.4	09.0	113 31.5	50.1	130 04.1	36.9
21	209 20.9	181 05.6	. . 04.3	304 42.7	. . 09.1	128 33.4	. . 50.2	145 06.2	. . 37.0
22	224 23.3	196 05.8	05.0	319 45.9	09.3	143 35.2	50.2	160 08.4	37.1
23	239 25.8	211 06.0	05.7	334 49.2	09.4	158 37.1	50.2	175 10.5	37.1
Pas. Mer.	h m 7 08.8	v 0.2	d 0.7	v 3.2	d 0.1	v 1.8	d 0.0	v 2.1	d 0.1

ESTRELLAS

Nombre	A.H.S.	Dec.
	° ′	° ′
Acamar	315 25.9	S40 18.0
Achernar	335 34.1	S57 13.7
Acrux	173 19.8	S63 06.6
Adhara	255 20.3	S28 58.6
Aldebaran	291 00.6	N16 30.6
Alioth	166 28.6	N55 57.5
Alkaid	153 05.9	N49 18.7
Al Na'ir	27 55.4	S46 57.1
Alnilam	275 56.3	S 1 12.1
Alphard	218 05.5	S 8 39.9
Alphecca	126 18.7	N26 42.7
Alpheratz	357 53.5	N29 05.6
Altair	62 17.2	N 8 52.2
Ankaa	353 25.1	S42 17.8
Antares	112 37.5	S26 26.1
Arcturus	146 04.1	N19 10.7
Atria	107 47.4	S69 01.8
Avior	234 22.4	S59 31.0
Bellatrix	278 42.5	N 6 21.0
Betelgeuse	271 11.9	N 7 24.4
Canopus	264 00.9	S52 41.9
Capella	280 49.0	N45 59.9
Deneb	49 37.7	N45 16.9
Denebola	182 43.2	N14 34.0
Diphda	349 05.5	S17 58.8
Dubhe	194 03.1	N61 45.0
Elnath	278 25.0	N28 36.5
Eltanin	90 50.0	N51 29.3
Enif	33 56.3	N 9 52.7
Fomalhaut	15 34.4	S29 36.9
Gacrux	172 11.3	S57 07.4
Gienah	176 02.0	S17 33.0
Hadar	149 01.0	S60 22.9
Hama	328 11.7	N23 27.9
Kaus Aust.	83 56.0	S34 23.0
Kochab	137 18.5	N74 09.2
Markab	13 47.8	N15 12.5
Menkar	314 25.3	N 4 05.6
Menkent	148 18.5	S36 22.7
Miaplacidus	221 42.2	S69 43.6
Mirfak	308 54.5	N49 51.7
Nunki	76 09.7	S26 17.7
Peacock	53 33.7	S56 43.7
Pollux	243 39.6	N28 01.5
Procyon	245 09.9	N 5 13.3
Rasalhague	96 14.9	N12 33.5
Regulus	207 53.7	N11 57.7
Rigel	281 21.5	S 8 12.1
Rigil Kent.	140 04.3	S60 50.5
Sabik	102 23.1	S15 43.6
Schedar	349 51.7	N56 32.3
Shaula	96 34.4	S37 06.2
Sirius	258 42.4	S16 43.1
Spica	158 41.1	S11 10.1
Suhail	222 59.7	S43 26.5
Vega	80 45.0	N38 47.0
Zuben'ubi	137 15.6	S16 02.8

	A.H.S.	Pas. Mer.
	° ′	h m
Venus	333 26.2	8 56
Marte	94 46.8	0 51
Júpiter	279 40.5	12 30
Saturno	296 00.5	11 24

T.U.	SOL A.H.G.	SOL Dec.	LUNA A.H.G.	LUNA v	LUNA Dec.	LUNA d	LUNA P.H.
d h	° ′	° ′	° ′	′	° ′	′	′
3 00	180 29.3	N22 17.6	37 07.8	11.8	S 8 53.5	12.5	57.7
01	195 29.2	17.9	51 38.6	11.8	9 06.0	12.4	57.6
02	210 29.1	18.2	66 09.4	11.8	9 18.4	12.3	57.6
03	225 29.0	18.5	80 40.2	11.7	9 30.7	12.3	57.6
04	240 28.9	18.8	95 10.9	11.8	9 43.0	12.2	57.6
05	255 28.8	19.1	109 41.7	11.7	9 55.2	12.1	57.6
06	270 28.7	N22 19.4	124 12.4	11.7	S10 07.3	12.2	57.5
07	285 28.6	19.7	138 43.1	11.6	10 19.5	12.0	57.5
D 08	300 28.5	20.0	153 13.7	11.7	10 31.5	12.0	57.5
O 09	315 28.4	20.3	167 44.4	11.6	10 43.5	11.9	57.5
M 10	330 28.3	20.6	182 15.0	11.6	10 55.4	11.9	57.5
I 11	345 28.2	20.9	196 45.6	11.6	11 07.3	11.8	57.4
N 12	0 28.0	N22 21.2	211 16.2	11.5	S11 19.1	11.7	57.4
G 13	15 27.9	21.5	225 46.7	11.5	11 30.8	11.7	57.4
O 14	30 27.8	21.8	240 17.2	11.5	11 42.5	11.6	57.4
15	45 27.7	22.1	254 47.7	11.5	11 54.1	11.5	57.4
16	60 27.6	22.4	269 18.2	11.5	12 05.6	11.5	57.3
17	75 27.5	22.7	283 48.7	11.4	12 17.1	11.4	57.3
18	90 27.4	N22 23.0	298 19.1	11.4	S12 28.5	11.3	57.3
19	105 27.3	23.3	312 49.5	11.4	12 39.8	11.3	57.3
20	120 27.2	23.6	327 19.9	11.3	12 51.1	11.2	57.3
21	135 27.1	23.9	341 50.2	11.4	13 02.3	11.1	57.2
22	150 27.0	24.2	356 20.6	11.3	13 13.4	11.0	57.2
23	165 26.9	24.5	10 50.9	11.2	13 24.4	11.0	57.2
4 00	180 26.8	N22 24.8	25 21.1	11.3	S13 35.4	10.8	57.2
01	195 26.7	25.1	39 51.4	11.2	13 46.2	10.9	57.1
02	210 26.6	25.4	54 21.6	11.2	13 57.1	10.7	57.1
03	225 26.5	25.7	68 51.8	11.1	14 07.8	10.6	57.1
04	240 26.4	26.0	83 21.9	11.1	14 18.4	10.6	57.1
05	255 26.3	26.3	97 52.0	11.1	14 29.0	10.5	57.1
06	270 26.2	N22 26.6	112 22.1	11.1	S14 39.5	10.4	57.0
07	285 26.1	26.8	126 52.2	11.0	14 49.9	10.3	57.0
08	300 25.9	27.1	141 22.2	11.0	15 00.2	10.3	57.0
L 09	315 25.8	27.4	155 52.2	11.0	15 10.5	10.1	57.0
U 10	330 25.7	27.7	170 22.2	11.0	15 20.6	10.1	57.0
N 11	345 25.6	28.0	184 52.2	10.9	15 30.7	10.0	56.9
12	0 25.5	N22 28.3	199 22.1	10.9	S15 40.7	9.9	56.9
E 13	15 25.4	28.6	213 52.0	10.8	15 50.6	9.8	56.9
14	30 25.3	28.8	228 21.8	10.9	16 00.4	9.7	56.9
S 15	45 25.2	29.1	242 51.7	10.8	16 10.1	9.7	56.9
16	60 25.1	29.4	257 21.5	10.7	16 19.8	9.5	56.8
17	75 25.0	29.7	271 51.2	10.8	16 29.3	9.5	56.8
18	90 24.9	N22 30.0	286 21.0	10.7	S16 38.8	9.3	56.8
19	105 24.8	30.3	300 50.7	10.6	16 48.1	9.3	56.8
20	120 24.7	30.5	315 20.3	10.7	16 57.4	9.2	56.7
21	135 24.6	30.8	329 50.0	10.6	17 06.6	9.1	56.7
22	150 24.4	31.1	344 19.6	10.6	17 15.7	9.0	56.7
23	165 24.3	31.4	358 49.2	10.6	17 24.7	8.8	56.7
5 00	180 24.2	N22 31.6	13 18.8	10.5	S17 33.5	8.8	56.7
01	195 24.1	31.9	27 48.3	10.5	17 42.3	8.7	56.6
02	210 24.0	32.2	42 17.8	10.4	17 51.0	8.6	56.6
03	225 23.9	32.5	56 47.2	10.5	17 59.6	8.5	56.6
04	240 23.8	32.7	71 16.7	10.4	18 08.1	8.4	56.6
05	255 23.7	33.0	85 46.1	10.4	18 16.5	8.3	56.6
06	270 23.6	N22 33.3	100 15.5	10.3	S18 24.8	8.2	56.5
07	285 23.5	33.6	114 44.8	10.4	18 33.0	8.1	56.5
M 08	300 23.4	33.8	129 14.2	10.3	18 41.1	8.0	56.5
A 09	315 23.2	34.1	143 43.5	10.2	18 49.1	7.9	56.5
R 10	330 23.1	34.4	158 12.7	10.3	18 57.0	7.7	56.4
T 11	345 23.0	34.6	172 42.0	10.2	19 04.7	7.7	56.4
E 12	0 22.9	N22 34.9	187 11.2	10.2	S19 12.4	7.6	56.4
S 13	15 22.8	35.2	201 40.4	10.1	19 20.0	7.5	56.4
14	30 22.7	35.5	216 09.5	10.2	19 27.5	7.3	56.4
15	45 22.6	35.7	230 38.7	10.1	19 34.8	7.3	56.3
16	60 22.5	36.0	245 07.8	10.1	19 42.1	7.1	56.3
17	75 22.4	36.3	259 36.9	10.0	19 49.2	7.0	56.3
18	90 22.2	N22 36.5	274 05.9	10.1	S19 56.2	7.0	56.3
19	105 22.1	36.8	288 35.0	10.0	20 03.2	6.8	56.3
20	120 22.0	37.0	303 04.0	10.0	20 10.0	6.7	56.2
21	135 21.9	37.3	317 33.0	10.0	20 16.7	6.6	56.2
22	150 21.8	37.6	332 02.0	9.9	20 23.3	6.5	56.2
23	165 21.7	37.8	346 30.9	9.9	S20 29.8	6.3	56.2
	SD 15.8	d 0.3	SD 15.6		15.5		15.4

Lat.	Crepúsculo Náutico	Crepúsculo Civil	Orto Sol	Orto Luna 3	Orto Luna 4	Orto Luna 5	Orto Luna 6
°	h m	h m	h m	h m	h m	h m	h m
N 72	▭	▭	▭	19 07	22 01	▬	▬
N 70	▭	▭	▭	18 42	20 54	▬	▬
68	▭	▭	▭	18 23	20 18	22 25	▬
66	////	////	00 59	18 08	19 53	21 39	23 23
64	////	////	01 51	17 56	19 33	21 09	22 38
62	////	////	02 22	17 45	19 17	20 47	22 08
60	////	01 18	02 45	17 37	19 04	20 29	21 45
N 58	////	01 55	03 04	17 29	18 53	20 14	21 27
56	////	02 20	03 19	17 22	18 43	20 01	21 12
54	01 11	02 40	03 32	17 16	18 35	19 50	20 59
52	01 45	02 57	03 44	17 11	18 27	19 40	20 47
50	02 09	03 11	03 54	17 06	18 20	19 31	20 37
45	02 50	03 38	04 15	16 56	18 05	19 13	20 16
N 40	03 19	04 00	04 32	16 47	17 53	18 58	19 59
35	03 41	04 17	04 46	16 40	17 43	18 45	19 44
30	03 59	04 32	04 59	16 33	17 34	18 34	19 32
20	04 27	04 55	05 20	16 22	17 19	18 15	19 11
N 10	04 48	05 15	05 38	16 12	17 05	17 59	18 52
0	05 06	05 32	05 55	16 03	16 53	17 44	18 35
S 10	05 22	05 49	06 11	15 54	16 41	17 28	18 18
20	05 38	06 05	06 29	15 45	16 27	17 12	18 00
30	05 53	06 23	06 49	15 34	16 13	16 54	17 39
35	06 02	06 33	07 01	15 28	16 04	16 43	17 27
40	06 10	06 44	07 14	15 21	15 54	16 31	17 13
45	06 20	06 57	07 30	15 13	15 43	16 17	16 56
S 50	06 31	07 12	07 50	15 04	15 29	15 59	16 36
52	06 36	07 19	07 59	14 59	15 23	15 51	16 26
54	06 41	07 27	08 10	14 54	15 16	15 42	16 15
56	06 47	07 35	08 21	14 49	15 08	15 32	16 03
58	06 53	07 45	08 35	14 43	14 59	15 20	15 49
S 60	07 00	07 56	08 51	14 36	14 49	15 07	15 32

Lat.	Ocaso Sol	Crepúsculo Civil	Crepúsculo Náutico	Ocaso Luna 3	Ocaso Luna 4	Ocaso Luna 5	Ocaso Luna 6
°	h m	h m	h m	h m	h m	h m	h m
N 72	▭	▭	▭	01 33	(01 02) (23 53)	▬	▬
N 70	▭	▭	▭	01 47	01 29	01 00	▬
68	▭	▭	▭	01 58	01 49	01 37	01 17
66	23 02	////	////	02 08	02 05	02 04	02 03
64	22 08	////	////	02 16	02 19	02 24	02 34
62	21 36	////	////	02 22	02 30	02 41	02 57
60	21 13	22 42	////	02 28	02 40	02 55	03 15
N 58	20 54	22 04	////	02 34	02 48	03 07	03 31
56	20 38	21 37	////	02 39	02 56	03 17	03 44
54	20 25	21 17	22 48	02 43	03 03	03 26	03 56
52	20 13	21 01	22 13	02 47	03 09	03 34	04 06
50	20 03	20 47	21 49	02 50	03 14	03 42	04 15
45	19 42	20 19	21 07	02 58	03 26	03 58	04 34
N 40	19 25	19 57	20 38	03 04	03 36	04 11	04 50
35	19 10	19 40	20 16	03 10	03 44	04 22	05 03
30	18 58	19 25	19 58	03 15	03 52	04 32	05 15
20	18 37	19 01	19 30	03 23	04 05	04 48	05 35
N 10	18 19	18 42	19 09	03 31	04 16	05 03	05 52
0	18 02	18 24	18 50	03 38	04 27	05 17	06 08
S 10	17 45	18 08	18 34	03 45	04 38	05 31	06 25
20	17 28	17 51	18 19	03 53	04 49	05 46	06 42
30	17 07	17 33	18 03	04 01	05 02	06 03	07 02
35	16 55	17 23	17 55	04 06	05 10	06 13	07 14
40	16 42	17 12	17 46	04 12	05 19	06 24	07 27
45	16 26	16 59	17 36	04 19	05 29	06 38	07 43
S 50	16 06	16 44	17 25	04 27	05 41	06 54	08 03
52	15 57	16 37	17 20	04 31	05 47	07 02	08 13
54	15 47	16 30	17 15	04 35	05 54	07 11	08 23
56	15 35	16 21	17 09	04 39	06 01	07 20	08 35
58	15 21	16 12	17 03	04 44	06 09	07 32	08 49
S 60	15 05	16 01	16 56	04 50	06 18	07 44	09 05

Día	SOL E.T. (+) 00h	SOL E.T. (+) 12h	SOL Pas. Mer.	LUNA Pas. Mer. Sup.	LUNA Pas. Mer. Inf.	LUNA Edad	LUNA Fase
d	m s	m s	h m	h m	h m	d	%
3	01 57	01 52	11 58	22 15	09 51	11	93
4	01 47	01 42	11 58	23 05	10 40	12	97
5	01 37	01 32	11 58	23 56	11 30	13	100

T.U.	ARIES	VENUS −4.3		MARTE −2.2		JUPITER −1.9		SATURNO +0.1	
d h	A.H.G. ° ′	A.H.G. ° ′	Dec. ° ′	A.H.G. ° ′	Dec. ° ′	A.H.G. ° ′	Dec. ° ′	A.H.G. ° ′	Dec. ° ′
6 00	254 28.3	226 06.2	N 9 06.5	349 52.5	S26 09.5	173 38.9	N22 50.3	190 12.6	N19 37.2
01	269 30.7	241 06.4	07.2	4 55.7	09.7	188 40.8	50.3	205 14.8	37.2
02	284 33.2	256 06.6	07.9	19 59.0	09.8	203 42.6	50.4	220 16.9	37.3
03	299 35.7	271 06.7 . .	08.6	35 02.3 . .	09.9	218 44.4 . .	50.4	235 19.0 . .	37.3
04	314 38.1	286 06.9	09.3	50 05.5	10.1	233 46.3	50.4	250 21.1	37.4
05	329 40.6	301 07.1	10.0	65 08.8	10.2	248 48.1	50.5	265 23.3	37.4
06	344 43.1	316 07.3	N 9 10.7	80 12.1	S26 10.3	263 50.0	N22 50.5	280 25.4	N19 37.5
07	359 45.5	331 07.5	11.5	95 15.4	10.4	278 51.8	50.6	295 27.5	37.6
M 08	14 48.0	346 07.7	12.2	110 18.6	10.6	293 53.6	50.6	310 29.7	37.6
I 09	29 50.4	1 07.9 . .	12.9	125 21.9 . .	10.7	308 55.5 . .	50.6	325 31.8 . .	37.7
E 10	44 52.9	16 08.0	13.6	140 25.2	10.8	323 57.3	50.7	340 33.9	37.7
R 11	59 55.4	31 08.2	14.3	155 28.4	10.9	338 59.2	50.7	355 36.0	37.8
C 12	74 57.8	46 08.4	N 9 15.0	170 31.7	S26 11.1	354 01.0	N22 50.8	10 38.2	N19 37.8
O 13	90 00.3	61 08.6	15.7	185 35.0	11.2	9 02.8	50.8	25 40.3	37.9
L 14	105 02.8	76 08.8	16.5	200 38.3	11.3	24 04.7	50.8	40 42.4	38.0
E 15	120 05.2	91 08.9 . .	17.2	215 41.6 . .	11.5	39 06.5 . .	50.9	55 44.6 . .	38.0
S 16	135 07.7	106 09.1	17.9	230 44.8	11.6	54 08.4	50.9	70 46.7	38.1
17	150 10.2	121 09.3	18.6	245 48.1	11.7	69 10.2	51.0	85 48.8	38.1
18	165 12.6	136 09.5	N 9 19.3	260 51.4	S26 11.8	84 12.0	N22 51.0	100 50.9	N19 38.2
19	180 15.1	151 09.6	20.0	275 54.7	12.0	99 13.9	51.0	115 53.1	38.2
20	195 17.6	166 09.8	20.8	290 58.0	12.1	114 15.7	51.1	130 55.2	38.3
21	210 20.0	181 10.0 . .	21.5	306 01.2 . .	12.2	129 17.6 . .	51.1	145 57.3 . .	38.4
22	225 22.5	196 10.2	22.2	321 04.5	12.3	144 19.4	51.2	160 59.5	38.4
23	240 24.9	211 10.3	22.9	336 07.8	12.5	159 21.2	51.2	176 01.6	38.5
7 00	255 27.4	226 10.5	N 9 23.6	351 11.1	S26 12.6	174 23.1	N22 51.2	191 03.7	N19 38.5
01	270 29.9	241 10.7	24.4	6 14.4	12.7	189 24.9	51.3	206 05.9	38.6
02	285 32.3	256 10.8	25.1	21 17.7	12.8	204 26.8	51.3	221 08.0	38.6
03	300 34.8	271 11.0 . .	25.8	36 21.0 . .	13.0	219 28.6 . .	51.4	236 10.1 . .	38.7
04	315 37.3	286 11.2	26.5	51 24.2	13.1	234 30.5	51.4	251 12.2	38.7
05	330 39.7	301 11.3	27.2	66 27.5	13.2	249 32.3	51.4	266 14.4	38.8
06	345 42.2	316 11.5	N 9 28.0	81 30.8	S26 13.3	264 34.1	N22 51.5	281 16.5	N19 38.9
07	0 44.7	331 11.7	28.7	96 34.1	13.5	279 36.0	51.5	296 18.6	38.9
J 08	15 47.1	346 11.8	29.4	111 37.4	13.6	294 37.8	51.6	311 20.8	39.0
U 09	30 49.6	1 12.0 . .	30.1	126 40.7 . .	13.7	309 39.7 . .	51.6	326 22.9 . .	39.0
E 10	45 52.1	16 12.2	30.8	141 44.0	13.8	324 41.5	51.6	341 25.0	39.1
V 11	60 54.5	31 12.3	31.6	156 47.3	14.0	339 43.3	51.7	356 27.1	39.1
E 12	75 57.0	46 12.5	N 9 32.3	171 50.6	S26 14.1	354 45.2	N22 51.7	11 29.3	N19 39.2
S 13	90 59.4	61 12.7	33.0	186 53.9	14.2	9 47.0	51.8	26 31.4	39.3
14	106 01.9	76 12.8	33.7	201 57.2	14.3	24 48.9	51.8	41 33.5	39.3
15	121 04.4	91 13.0 . .	34.4	217 00.5 . .	14.4	39 50.7 . .	51.8	56 35.7 . .	39.4
16	136 06.8	106 13.1	35.2	232 03.8	14.6	54 52.5	51.9	71 37.8	39.4
17	151 09.3	121 13.3	35.9	247 07.1	14.7	69 54.4	51.9	86 39.9	39.5
18	166 11.8	136 13.4	N 9 36.6	262 10.4	S26 14.8	84 56.2	N22 52.0	101 42.1	N19 39.5
19	181 14.2	151 13.6	37.3	277 13.7	14.9	99 58.1	52.0	116 44.2	39.6
20	196 16.7	166 13.8	38.1	292 17.0	15.1	114 59.9	52.0	131 46.3	39.6
21	211 19.2	181 13.9 . .	38.8	307 20.3 . .	15.2	130 01.7 . .	52.1	146 48.4 . .	39.7
22	226 21.6	196 14.1	39.5	322 23.6	15.3	145 03.6	52.1	161 50.6	39.8
23	241 24.1	211 14.2	40.2	337 26.9	15.4	160 05.4	52.1	176 52.7	39.8
8 00	256 26.6	226 14.4	N 9 41.0	352 30.2	S26 15.5	175 07.3	N22 52.2	191 54.8	N19 39.9
01	271 29.0	241 14.5	41.7	7 33.5	15.7	190 09.1	52.2	206 57.0	39.9
02	286 31.5	256 14.7	42.4	22 36.8	15.8	205 10.9	52.3	221 59.1	40.0
03	301 33.9	271 14.8 . .	43.1	37 40.1 . .	15.9	220 12.8 . .	52.3	237 01.2 . .	40.0
04	316 36.4	286 15.0	43.9	52 43.4	16.0	235 14.6	52.3	252 03.4	40.1
05	331 38.9	301 15.1	44.6	67 46.7	16.1	250 16.5	52.4	267 05.5	40.1
06	346 41.3	316 15.3	N 9 45.3	82 50.0	S26 16.3	265 18.3	N22 52.4	282 07.6	N19 40.2
07	1 43.8	331 15.4	46.0	97 53.3	16.4	280 20.1	52.5	297 09.7	40.3
08	16 46.3	346 15.6	46.8	112 56.6	16.5	295 22.0	52.5	312 11.9	40.3
V 09	31 48.7	1 15.7 . .	47.5	127 59.9 . .	16.6	310 23.8 . .	52.5	327 14.0 . .	40.4
I 10	46 51.2	16 15.8	48.2	143 03.2	16.7	325 25.7	52.6	342 16.1	40.4
E 11	61 53.7	31 16.0	48.9	158 06.6	16.9	340 27.5	52.6	357 18.3	40.5
R 12	76 56.1	46 16.1	N 9 49.7	173 09.9	S26 17.0	355 29.3	N22 52.6	12 20.4	N19 40.5
N 13	91 58.6	61 16.3	50.4	188 13.2	17.1	10 31.2	52.7	27 22.5	40.6
E 14	107 01.1	76 16.4	51.1	203 16.5	17.2	25 33.0	52.7	42 24.7	40.6
S 15	122 03.5	91 16.6 . .	51.8	218 19.8 . .	17.3	40 34.9 . .	52.8	57 26.8 . .	40.7
16	137 06.0	106 16.7	52.6	233 23.1	17.5	55 36.7	52.8	72 28.9	40.8
17	152 08.4	121 16.8	53.3	248 26.4	17.6	70 38.5	52.8	87 31.0	40.8
18	167 10.9	136 17.0	N 9 54.0	263 29.8	S26 17.7	85 40.4	N22 52.9	102 33.2	N19 40.9
19	182 13.4	151 17.1	54.8	278 33.1	17.8	100 42.2	52.9	117 35.3	40.9
20	197 15.8	166 17.3	55.5	293 36.4	17.9	115 44.1	52.9	132 37.4	41.0
21	212 18.3	181 17.4 . .	56.2	308 39.7 . .	18.1	130 45.9 . .	53.0	147 39.6 . .	41.0
22	227 20.8	196 17.5	56.9	323 43.0	18.2	145 47.7	53.0	162 41.7	41.1
23	242 23.2	211 17.7	57.7	338 46.3	18.3	160 49.6	53.1	177 43.8	41.1
Pas. Mer.	h m 6 57.0	v 0.2	d 0.7	v 3.3	d 0.1	v 1.8	d 0.0	v 2.1	d 0.1

ESTRELLAS

Nombre	A.H.S. ° ′	Dec. ° ′
Acamar	315 25.8	S40 18.0
Achernar	335 34.1	S57 13.7
Acrux	173 19.8	S63 06.6
Adhara	255 20.3	S28 58.5
Aldebaran	291 00.6	N16 30.6
Alioth	166 28.6	N55 57.5
Alkaid	153 06.0	N49 18.7
Al Na'ir	27 55.4	S46 57.1
Alnilam	275 56.3	S 1 12.1
Alphard	218 05.5	S 8 39.9
Alphecca	126 18.7	N26 42.7
Alpheratz	357 53.4	N29 05.6
Altair	62 17.2	N 8 52.2
Ankaa	353 25.1	S42 17.8
Antares	112 37.5	S26 26.1
Arcturus	146 04.1	N19 10.7
Atria	107 47.3	S69 01.8
Avior	234 22.4	S59 31.0
Bellatrix	278 42.5	N 6 21.0
Betelgeuse	271 11.9	N 7 24.4
Canopus	264 00.9	S52 41.9
Capella	280 48.9	N45 59.9
Deneb	49 37.7	N45 16.9
Denebola	182 43.2	N14 34.0
Diphda	349 05.5	S17 58.8
Dubhe	194 03.2	N61 45.0
Elnath	278 25.0	N28 36.4
Eltanin	90 50.0	N51 29.3
Enif	33 56.3	N 9 52.7
Fomalhaut	15 34.3	S29 36.8
Gacrux	172 11.4	S57 07.4
Gienah	176 02.0	S17 33.0
Hadar	149 01.0	S60 22.9
Hamal	328 11.7	N23 27.9
Kaus Aust.	83 56.0	S34 23.0
Kochab	137 18.5	N74 09.3
Markab	13 47.8	N15 12.6
Menkar	314 25.2	N 4 05.6
Menkent	148 18.5	S36 22.7
Miaplacidus	221 42.3	S69 43.6
Mirfak	308 54.4	N49 51.7
Nunki	76 09.7	S26 17.7
Peacock	53 33.6	S56 43.7
Pollux	243 39.6	N28 01.5
Procyon	245 09.9	N 5 13.3
Rasalhague	96 14.9	N12 33.5
Regulus	207 53.7	N11 57.7
Rigel	281 21.5	S 8 12.1
Rigil Kent.	140 04.3	S60 50.5
Sabik	102 23.0	S15 43.6
Schedar	349 51.6	N56 32.3
Shaula	96 34.3	S37 06.2
Sirius	258 42.4	S16 43.1
Spica	158 41.1	S11 10.1
Suhail	222 59.7	S43 26.5
Vega	80 45.0	N38 47.0
Zuben ubi	137 15.6	S16 02.8

	A.H.S. ° ′	Pas. Mer. h m
Venus	330 43.1	8 55
Marte	95 43.7	0 35
Júpiter	278 55.7	12 21
Saturno	295 36.3	11 14

T.U.	SOL A.H.G.	SOL Dec.	LUNA A.H.G.	v	LUNA Dec.	d	P.H.
d h	° ′	° ′	° ′	′	° ′	′	′
6 00	180 21.6	N22 38.1	0 59.8	10.0	S20 36.1	6.3	56.1
01	195 21.5	38.4	15 28.8	9.8	20 42.4	6.1	56.1
02	210 21.4	38.6	29 57.6	9.9	20 48.5	6.1	56.1
03	225 21.2	38.9	44 26.5	9.9	20 54.6	5.9	56.1
04	240 21.1	39.1	58 55.4	9.8	21 00.5	5.8	56.1
05	255 21.0	39.4	73 24.2	9.8	21 06.3	5.7	56.0
06	270 20.9	N22 39.6	87 53.0	9.8	S21 12.0	5.5	56.0
M 07	285 20.8	39.9	102 21.8	9.8	21 17.5	5.5	56.0
I 08	300 20.7	40.2	116 50.6	9.8	21 23.0	5.3	56.0
E 09	315 20.6	40.4	131 19.4	9.7	21 28.3	5.3	55.9
R 10	330 20.4	40.7	145 48.1	9.7	21 33.6	5.1	55.9
C 11	345 20.3	40.9	160 16.8	9.8	21 38.7	5.0	55.9
12	0 20.2	N22 41.2	174 45.6	9.7	S21 43.7	4.8	55.9
O 13	15 20.1	41.4	189 14.3	9.7	21 48.5	4.8	55.9
L 14	30 20.0	41.7	203 43.0	9.7	21 53.3	4.6	55.8
E 15	45 19.9	41.9	218 11.7	9.7	21 57.9	4.5	55.8
S 16	60 19.8	42.2	232 40.4	9.6	22 02.4	4.4	55.8
17	75 19.7	42.4	247 09.0	9.7	22 06.8	4.3	55.8
18	90 19.5	N22 42.7	261 37.7	9.6	S22 11.1	4.2	55.8
19	105 19.4	42.9	276 06.3	9.7	22 15.3	4.0	55.7
20	120 19.3	43.2	290 35.0	9.6	22 19.3	3.9	55.7
21	135 19.2	43.4	305 03.6	9.7	22 23.2	3.8	55.7
22	150 19.1	43.7	319 32.3	9.6	22 27.0	3.7	55.7
23	165 19.0	43.9	334 00.9	9.6	22 30.7	3.6	55.7
7 00	180 18.8	N22 44.1	348 29.5	9.7	S22 34.3	3.4	55.6
01	195 18.7	44.4	2 58.2	9.6	22 37.7	3.4	55.6
02	210 18.6	44.6	17 26.8	9.6	22 41.1	3.1	55.6
03	225 18.5	44.9	31 55.4	9.6	22 44.2	3.1	55.6
04	240 18.4	45.1	46 24.0	9.7	22 47.3	3.0	55.6
05	255 18.3	45.4	60 52.7	9.6	22 50.3	2.8	55.5
06	270 18.2	N22 45.6	75 21.3	9.6	S22 53.1	2.7	55.5
07	285 18.0	45.8	89 49.9	9.7	22 55.8	2.6	55.5
J 08	300 17.9	46.1	104 18.6	9.6	22 58.4	2.5	55.5
U 09	315 17.8	46.3	118 47.2	9.6	23 00.9	2.3	55.4
E 10	330 17.7	46.5	133 15.8	9.7	23 03.2	2.3	55.4
V 11	345 17.6	46.8	147 44.5	9.7	23 05.5	2.1	55.4
E 12	0 17.5	N22 47.0	162 13.2	9.6	S23 07.6	2.0	55.4
S 13	15 17.3	47.3	176 41.8	9.7	23 09.6	1.8	55.4
14	30 17.2	47.5	191 10.5	9.7	23 11.4	1.8	55.4
15	45 17.1	47.7	205 39.2	9.7	23 13.2	1.6	55.3
16	60 17.0	48.0	220 07.9	9.7	23 14.8	1.5	55.3
17	75 16.9	48.2	234 36.6	9.7	23 16.3	1.4	55.3
18	90 16.8	N22 48.4	249 05.3	9.8	S23 17.7	1.2	55.3
19	105 16.6	48.6	263 34.1	9.7	23 18.9	1.2	55.3
20	120 16.5	48.9	278 02.8	9.8	23 20.1	1.0	55.2
21	135 16.4	49.1	292 31.6	9.8	23 21.1	0.9	55.2
22	150 16.3	49.3	307 00.4	9.8	23 22.0	0.7	55.2
23	165 16.2	49.6	321 29.2	9.8	23 22.7	0.7	55.2
8 00	180 16.0	N22 49.8	335 58.0	9.8	S23 23.4	0.5	55.2
01	195 15.9	50.0	350 26.8	9.9	23 23.9	0.5	55.1
02	210 15.8	50.2	4 55.7	9.9	23 24.4	0.2	55.1
03	225 15.7	50.5	19 24.6	9.9	23 24.6	0.2	55.1
04	240 15.6	50.7	33 53.5	9.9	23 24.8	0.1	55.1
05	255 15.5	50.9	48 22.4	10.0	23 24.9	0.1	55.1
06	270 15.3	N22 51.1	62 51.4	9.9	S23 24.8	0.2	55.1
07	285 15.2	51.4	77 20.3	10.1	23 24.6	0.3	55.0
V 08	300 15.1	51.6	91 49.4	10.0	23 24.3	0.4	55.0
I 09	315 15.0	51.8	106 18.4	10.0	23 23.9	0.5	55.0
E 10	330 14.9	52.0	120 47.4	10.1	23 23.4	0.7	55.0
R 11	345 14.7	52.3	135 16.5	10.1	23 22.7	0.8	55.0
N 12	0 14.6	N22 52.5	149 45.6	10.2	S23 21.9	0.8	54.9
E 13	15 14.5	52.7	164 14.8	10.2	23 21.1	1.1	54.9
S 14	30 14.4	52.9	178 44.0	10.2	23 20.0	1.1	54.9
15	45 14.3	53.1	193 13.2	10.2	23 18.9	1.2	54.9
16	60 14.1	53.3	207 42.4	10.3	23 17.7	1.4	54.9
17	75 14.0	53.6	222 11.7	10.3	23 16.3	1.4	54.9
18	90 13.9	N22 53.8	236 41.0	10.3	S23 14.9	1.6	54.8
19	105 13.8	54.0	251 10.3	10.4	23 13.3	1.7	54.8
20	120 13.7	54.2	265 39.7	10.4	23 11.6	1.8	54.8
21	135 13.5	54.4	280 09.1	10.5	23 09.8	1.9	54.8
22	150 13.4	54.6	294 38.6	10.5	23 07.9	2.1	54.8
23	165 13.3	54.8	309 08.1	10.5	S23 05.8	2.1	54.8
	SD 15.8	d 0.2	SD 15.2		15.1		15.0

Lat.	Crepúsculo Náutico	Crepúsculo Civil	Orto Sol	Orto Luna 6	Orto Luna 7	Orto Luna 8	Orto Luna 9
°	h m	h m	h m	h m	h m	h m	h m
N 72	▭	▭	▭	▬	▬	▬	▬
N 70	▭	▭	▭	▬	▬	▬	▬
68	▭	▭	▭	▬	▬	▬	▬
66	////	////	00 45	23 23	24 48	00 48	01 22
64	////	////	01 44	22 38	23 48	24 31	00 31
62	////	////	02 18	22 08	23 14	24 00	00 00
60	////	01 10	02 42	21 45	22 49	23 36	24 09
N 58	////	01 50	03 01	21 27	22 29	23 17	23 52
56	////	02 17	03 17	21 12	22 13	23 01	23 38
54	01 03	02 37	03 30	20 59	21 59	22 48	23 26
52	01 41	02 54	03 42	20 47	21 47	22 36	23 15
50	02 06	03 09	03 52	20 37	21 36	22 25	23 06
45	02 48	03 37	04 14	20 16	21 13	22 03	22 46
N 40	03 18	03 59	04 31	19 59	20 55	21 46	22 29
35	03 40	04 16	04 46	19 44	20 40	21 31	22 16
30	03 58	04 31	04 58	19 32	20 27	21 18	22 03
20	04 26	04 55	05 20	19 11	20 05	20 56	21 43
N 10	04 48	05 15	05 38	18 52	19 45	20 36	21 25
0	05 07	05 33	05 55	18 35	19 27	20 18	21 08
S 10	05 23	05 49	06 12	18 18	19 09	20 00	20 51
20	05 39	06 06	06 30	18 00	18 50	19 41	20 33
30	05 55	06 24	06 51	17 39	18 28	19 19	20 13
35	06 03	06 35	07 03	17 27	18 15	19 06	20 00
40	06 12	06 46	07 16	17 13	18 00	18 51	19 46
45	06 22	06 59	07 32	16 56	17 42	18 33	19 30
S 50	06 33	07 14	07 52	16 36	17 20	18 11	19 09
52	06 38	07 21	08 02	16 26	17 09	18 01	18 59
54	06 44	07 29	08 13	16 15	16 57	17 49	18 48
56	06 49	07 38	08 25	16 03	16 44	17 35	18 36
58	06 56	07 48	08 39	15 49	16 28	17 19	18 21
S 60	07 03	07 59	08 55	15 32	16 09	17 00	18 04

Lat.	Ocaso Sol	Crepúsculo Civil	Crepúsculo Náutico	Ocaso Luna 6	Ocaso Luna 7	Ocaso Luna 8	Ocaso Luna 9
°	h m	h m	h m	h m	h m	h m	h m
N 72	▭	▭	▭	▬	▬	▬	▬
N 70	▭	▭	▭	▬	▬	▬	▬
68	▭	▭	▭	01 17	▬	▬	▬
66	23 18	////	////	02 03	02 07	02 31	03 43
64	22 15	////	////	02 34	02 53	03 31	04 33
62	21 41	////	////	02 57	03 23	04 05	05 05
60	21 17	22 51	////	03 15	03 46	04 30	05 28
N 58	20 58	22 09	////	03 31	04 04	04 50	05 47
56	20 42	21 42	////	03 44	04 20	05 06	06 03
54	20 28	21 21	22 56	03 56	04 33	05 20	06 16
52	20 16	21 04	22 18	04 06	04 45	05 32	06 28
50	20 06	20 50	21 53	04 15	04 55	05 43	06 38
45	19 44	20 21	21 10	04 34	05 17	06 05	07 00
N 40	19 27	19 59	20 40	04 50	05 34	06 24	07 17
35	19 12	19 42	20 18	05 03	05 49	06 39	07 32
30	18 59	19 27	20 00	05 15	06 02	06 52	07 45
20	18 38	19 02	19 31	05 35	06 24	07 14	08 06
N 10	18 20	18 43	19 09	05 52	06 42	07 34	08 25
0	18 02	18 25	18 51	06 08	07 00	07 52	08 43
S 10	17 46	18 08	18 35	06 25	07 18	08 10	09 00
20	17 28	17 51	18 19	06 42	07 37	08 30	09 19
30	17 07	17 33	18 03	07 02	07 59	08 52	09 40
35	16 55	17 23	17 55	07 14	08 12	09 05	09 53
40	16 41	17 12	17 45	07 27	08 26	09 20	10 07
45	16 25	16 59	17 36	07 43	08 44	09 38	10 24
S 50	16 05	16 43	17 24	08 03	09 06	10 00	10 45
52	15 56	16 36	17 19	08 13	09 16	10 11	10 55
54	15 45	16 28	17 14	08 23	09 28	10 23	11 06
56	15 33	16 19	17 08	08 35	09 42	10 37	11 19
58	15 19	16 10	17 02	08 49	09 57	10 53	11 34
S 60	15 02	15 59	16 55	09 05	10 16	11 12	11 52

Día	SOL E.T. (+) 00h	SOL E.T. (+) 12h	SOL Pas. Mer.	LUNA Pas. Sup.	LUNA Mer. Inf.	LUNA Edad	LUNA Fase
d	m s	m s	h m	h m	h m	d	%
6	01 27	01 21	11 59	24 48	12 22	14	100
7	01 16	01 10	11 59	00 48	13 14	15	98
8	01 04	00 59	11 59	01 40	14 05	16	94

T.U.	ARIES	VENUS −4.3		MARTE −2.3		JUPITER −1.9		SATURNO +0.1	
	A.H.G.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
12 00	260 23.1	226 25.4	N10 51.2	357 50.2	S26 26.3	178 03.8	N22 55.7	195 19.4	N19 45.1
01	275 25.6	241 25.5	52.0	12 53.6	26.4	193 05.7	55.7	210 21.5	45.2
02	290 28.0	256 25.6	52.7	27 56.9	26.5	208 07.5	55.8	225 23.7	45.2
03	305 30.5	271 25.7	. . 53.4	43 00.3	. . 26.6	223 09.4	. . 55.8	240 25.8	. . 45.3
04	320 33.0	286 25.7	54.2	58 03.6	26.7	238 11.2	55.8	255 27.9	45.4
05	335 35.4	301 25.8	54.9	73 07.0	26.9	253 13.0	55.9	270 30.1	45.4
06	350 37.9	316 25.9	N10 55.7	88 10.4	S26 27.0	268 14.9	N22 55.9	285 32.2	N19 45.5
07	5 40.4	331 26.0	56.4	103 13.7	27.1	283 16.7	55.9	300 34.3	45.5
M 08	20 42.8	346 26.0	57.1	118 17.1	27.2	298 18.5	56.0	315 36.5	45.6
A 09	35 45.3	1 26.1	. . 57.9	133 20.4	. . 27.3	313 20.4	. . 56.0	330 38.6	. . 45.6
R 10	50 47.8	16 26.2	58.6	148 23.8	27.4	328 22.2	56.0	345 40.7	45.7
11	65 50.2	31 26.3	10 59.4	163 27.2	27.5	343 24.1	56.1	0 42.9	45.7
T 12	80 52.7	46 26.3	N11 00.1	178 30.5	S26 27.6	358 25.9	N22 56.1	15 45.0	N19 45.8
13	95 55.1	61 26.4	00.8	193 33.9	27.7	13 27.7	56.2	30 47.1	45.8
E 14	110 57.6	76 26.5	01.6	208 37.3	27.8	28 29.6	56.2	45 49.3	45.9
S 15	126 00.1	91 26.5	. . 02.3	223 40.6	. . 27.9	43 31.4	. . 56.2	60 51.4	. . 45.9
16	141 02.5	106 26.6	03.0	238 44.0	28.0	58 33.3	56.3	75 53.5	46.0
17	156 05.0	121 26.7	03.8	253 47.4	28.1	73 35.1	56.3	90 55.7	46.1
18	171 07.5	136 26.7	N11 04.5	268 50.7	S26 28.2	88 36.9	N22 56.3	105 57.8	N19 46.1
19	186 09.9	151 26.8	05.3	283 54.1	28.3	103 38.8	56.4	120 59.9	46.2
20	201 12.4	166 26.9	06.0	298 57.5	28.4	118 40.6	56.4	136 02.0	46.2
21	216 14.9	181 26.9	. . 06.7	314 00.8	. . 28.5	133 42.4	. . 56.4	151 04.2	. . 46.3
22	231 17.3	196 27.0	07.5	329 04.2	28.6	148 44.3	56.5	166 06.3	46.3
23	246 19.8	211 27.1	08.2	344 07.6	28.7	163 46.1	56.5	181 08.4	46.4
13 00	261 22.3	226 27.1	N11 09.0	359 10.9	S26 28.7	178 48.0	N22 56.5	196 10.6	N19 46.4
01	276 24.7	241 27.2	09.7	14 14.3	28.8	193 49.8	56.6	211 12.7	46.5
02	291 27.2	256 27.3	10.4	29 17.7	28.9	208 51.6	56.6	226 14.8	46.5
03	306 29.6	271 27.3	. . 11.2	44 21.0	. . 29.0	223 53.5	. . 56.6	241 17.0	. . 46.6
04	321 32.1	286 27.4	11.9	59 24.4	29.1	238 55.3	56.7	256 19.1	46.6
05	336 34.6	301 27.4	12.7	74 27.8	29.2	253 57.2	56.7	271 21.2	46.7
06	351 37.0	316 27.5	N11 13.4	89 31.1	S26 29.3	268 59.0	N22 56.7	286 23.4	N19 46.7
M 07	6 39.5	331 27.5	14.1	104 34.5	29.4	284 00.8	56.8	301 25.5	46.8
I 08	21 42.0	346 27.6	14.9	119 37.9	29.5	299 02.7	56.8	316 27.6	46.9
E 09	36 44.4	1 27.7	. . 15.6	134 41.2	. . 29.6	314 04.5	. . 56.8	331 29.8	. . 46.9
R 10	51 46.9	16 27.7	16.4	149 44.6	29.7	329 06.4	56.9	346 31.9	47.0
C 11	66 49.4	31 27.8	17.1	164 48.0	29.8	344 08.2	56.9	1 34.0	47.0
O 12	81 51.8	46 27.8	N11 17.8	179 51.4	S26 29.9	359 10.0	N22 56.9	16 36.2	N19 47.1
L 13	96 54.3	61 27.9	18.6	194 54.7	30.0	14 11.9	57.0	31 38.3	47.1
E 14	111 56.7	76 27.9	19.3	209 58.1	30.1	29 13.7	57.0	46 40.4	47.2
S 15	126 59.2	91 28.0	. . 20.1	225 01.5	. . 30.2	44 15.5	. . 57.0	61 42.6	. . 47.2
16	142 01.7	106 28.0	20.8	240 04.8	30.3	59 17.4	57.1	76 44.7	47.3
17	157 04.1	121 28.1	21.6	255 08.2	30.4	74 19.2	57.1	91 46.8	47.3
18	172 06.6	136 28.1	N11 22.3	270 11.6	S26 30.5	89 21.1	N22 57.1	106 49.0	N19 47.4
19	187 09.1	151 28.2	23.0	285 15.0	30.6	104 22.9	57.2	121 51.1	47.4
20	202 11.5	166 28.2	23.8	300 18.3	30.7	119 24.7	57.2	136 53.2	47.5
21	217 14.0	181 28.3	. . 24.5	315 21.7	. . 30.8	134 26.6	. . 57.2	151 55.4	. . 47.5
22	232 16.5	196 28.3	25.3	330 25.1	30.9	149 28.4	57.2	166 57.5	47.6
23	247 18.9	211 28.4	26.0	345 28.5	30.9	164 30.2	57.3	181 59.6	47.6
14 00	262 21.4	226 28.4	N11 26.7	0 31.8	S26 31.0	179 32.1	N22 57.3	197 01.8	N19 47.7
01	277 23.9	241 28.4	27.5	15 35.2	31.1	194 33.9	57.3	212 03.9	47.8
02	292 26.3	256 28.5	28.2	30 38.6	31.2	209 35.8	57.4	227 06.0	47.8
03	307 28.8	271 28.5	. . 29.0	45 42.0	. . 31.3	224 37.6	. . 57.4	242 08.2	. . 47.9
04	322 31.2	286 28.6	29.7	60 45.3	31.4	239 39.4	57.4	257 10.3	47.9
05	337 33.7	301 28.6	30.4	75 48.7	31.5	254 41.3	57.5	272 12.4	48.0
06	352 36.2	316 28.7	N11 31.2	90 52.1	S26 31.6	269 43.1	N22 57.5	287 14.6	N19 48.0
07	7 38.6	331 28.7	31.9	105 55.5	31.7	284 45.0	57.5	302 16.7	48.1
J 08	22 41.1	346 28.7	32.7	120 58.8	31.8	299 46.8	57.6	317 18.8	48.1
U 09	37 43.6	1 28.8	. . 33.4	136 02.2	. . 31.9	314 48.6	. . 57.6	332 21.0	. . 48.2
E 10	52 46.0	16 28.8	34.2	151 05.6	32.0	329 50.5	57.6	347 23.1	48.2
V 11	67 48.5	31 28.8	34.9	166 09.0	32.0	344 52.3	57.7	2 25.2	48.3
12	82 51.0	46 28.9	N11 35.6	181 12.3	S26 32.1	359 54.2	N22 57.7	17 27.4	N19 48.3
E 13	97 53.4	61 28.9	36.4	196 15.7	32.2	14 56.0	57.7	32 29.5	48.4
14	112 55.9	76 29.0	37.1	211 19.1	32.3	29 57.8	57.8	47 31.6	48.4
S 15	127 58.4	91 29.0	. . 37.9	226 22.5	. . 32.4	44 59.7	. . 57.8	62 33.8	. . 48.5
16	143 00.8	106 29.0	38.6	241 25.8	32.5	60 01.5	57.8	77 35.9	48.5
17	158 03.3	121 29.1	39.3	256 29.2	32.6	75 03.4	57.9	92 38.1	48.6
18	173 05.7	136 29.1	N11 40.1	271 32.6	S26 32.7	90 05.2	N22 57.9	107 40.2	N19 48.7
19	188 08.2	151 29.1	40.8	286 36.0	32.8	105 07.0	57.9	122 42.3	48.7
20	203 10.7	166 29.1	41.6	301 39.4	32.8	120 08.9	58.0	137 44.5	48.8
21	218 13.1	181 29.2	. . 42.3	316 42.7	. . 32.9	135 10.7	. . 58.0	152 46.6	. . 48.8
22	233 15.6	196 29.2	43.0	331 46.1	33.0	150 12.6	58.0	167 48.7	48.9
23	248 18.1	211 29.2	43.8	346 49.5	33.1	165 14.4	58.0	182 50.9	48.9
	h m								
Pas. Mer.	6 33.4	v 0.1	d 0.7	v 3.4	d 0.1	v 1.8	d 0.0	v 2.1	d 0.1

ESTRELLAS

Nombre	A.H.S.	Dec.
	° ′	° ′
Acamar	315 25.8	S40 17.9
Achernar	335 34.0	S57 13.6
Acrux	173 19.8	S63 06.6
Adhara	255 20.3	S28 58.5
Aldebaran	291 00.6	N16 30.6
Alioth	166 28.7	N55 57.5
Alkaid	153 06.0	N49 18.7
Al Na'ir	27 55.3	S46 57.1
Alnilam	275 56.3	S 1 12.1
Alphard	218 05.5	S 8 39.9
Alphecca	126 18.7	N26 42.7
Alpheratz	357 53.4	N29 05.6
Altair	62 17.2	N 8 52.3
Ankaa	353 25.1	S42 17.8
Antares	112 37.5	S26 26.1
Arcturus	146 04.1	N19 10.7
Atria	107 47.3	S69 01.8
Avior	234 22.4	S59 31.0
Bellatrix	278 42.5	N 6 21.0
Betelgeuse	271 11.9	N 7 24.4
Canopus	264 00.9	S52 41.9
Capella	280 48.9	N45 59.9
Deneb	49 37.6	N45 16.9
Denebola	182 43.2	N14 34.0
Diphda	349 05.4	S17 58.8
Dubhe	194 03.2	N61 45.0
Elnath	278 25.0	N28 36.5
Eltanin	90 50.0	N51 29.3
Enif	33 56.2	N 9 52.7
Fomalhaut	15 34.3	S29 36.8
Gacrux	172 11.4	S57 07.4
Gienah	176 02.0	S17 33.0
Hadar	149 01.0	S60 22.9
Hamal	328 11.7	N23 27.9
Kaus Aust.	83 55.9	S34 23.0
Kochab	137 18.6	N74 09.3
Markab	13 47.7	N15 12.6
Menkar	314 25.2	N 4 05.6
Menkent	148 18.5	S36 22.7
Miaplacidus	221 42.3	S69 43.6
Mirfak	308 54.4	N49 51.7
Nunki	76 09.6	S26 17.7
Peacock	53 33.6	S56 43.7
Pollux	243 39.6	N28 01.5
Procyon	245 09.9	N 5 13.3
Rasalhague	96 14.9	N12 33.6
Regulus	207 53.7	N11 57.7
Rigel	281 21.5	S 8 12.1
Rigil Kent.	140 04.3	S60 50.6
Sabik	102 23.0	S15 43.6
Schedar	349 51.6	N56 32.3
Shaula	96 34.3	S37 06.3
Sirius	258 42.4	S16 43.1
Spica	158 41.1	S11 10.1
Suhail	222 59.7	S43 26.4
Vega	80 44.9	N38 47.0
Zuben'ubi	137 15.6	S16 02.8

	A.H.S.	Pas. Mer.
	° ′	h m
Venus	325 04.9	8 54
Marte	97 48.7	0 03
Júpiter	277 25.7	12 03
Saturno	294 48.3	10 54

T.U.	SOL				LUNA					
	A.H.G.		Dec.		A.H.G.	v	Dec.	d	P.H.	
d h	°	′	°	′	°	′	°	′	′	′
12 00	180	04.2	N23	08.4	289	08.3	14.0	S16	10.1	8.7	54.2
01	195	04.1		08.5	303	41.3	14.1	16	01.4	8.8	54.2
02	210	03.9		08.7	318	14.4	14.2	15	52.6	8.9	54.2
03	225	03.8	. .	08.9	332	47.6	14.2	15	43.7	9.0	54.2
04	240	03.7		09.0	347	20.8	14.2	15	34.7	9.0	54.2
05	255	03.5		09.2	1	54.0	14.2	15	25.7	9.1	54.2
06	270	03.4	N23	09.3	16	27.2	14.3	S15	16.6	9.2	54.2
07	285	03.3		09.5	31	00.5	14.4	15	07.4	9.2	54.2
M 08	300	03.2		09.6	45	33.9	14.4	14	58.2	9.3	54.2
A 09	315	03.0	. .	09.8	60	07.3	14.4	14	48.9	9.3	54.2
R 10	330	02.9		09.9	74	40.7	14.5	14	39.6	9.4	54.2
11	345	02.8		10.1	89	14.2	14.5	14	30.2	9.5	54.2
T 12	0	02.6	N23	10.2	103	47.7	14.5	S14	20.7	9.5	54.2
13	15	02.5		10.4	118	21.2	14.6	14	11.2	9.6	54.2
E 14	30	02.4		10.5	132	54.8	14.6	14	01.6	9.6	54.2
S 15	45	02.3	. .	10.7	147	28.4	14.6	13	52.0	9.7	54.2
16	60	02.1		10.8	162	02.0	14.7	13	42.3	9.7	54.2
17	75	02.0		11.0	176	35.7	14.7	13	32.6	9.8	54.3
18	90	01.9	N23	11.1	191	09.4	14.8	S13	22.8	9.9	54.3
19	105	01.7		11.3	205	43.2	14.8	13	12.9	9.9	54.3
20	120	01.6		11.4	220	17.0	14.8	13	03.0	10.0	54.3
21	135	01.5	. .	11.6	234	50.8	14.8	12	53.0	10.0	54.3
22	150	01.4		11.7	249	24.6	14.9	12	43.0	10.1	54.3
23	165	01.2		11.9	263	58.5	14.9	12	32.9	10.1	54.3
13 00	180	01.1	N23	12.0	278	32.4	15.0	S12	22.8	10.2	54.3
01	195	01.0		12.2	293	06.4	14.9	12	12.6	10.3	54.3
02	210	00.8		12.3	307	40.3	15.0	12	02.3	10.3	54.3
03	225	00.7	. .	12.4	322	14.3	15.0	11	52.0	10.3	54.3
04	240	00.6		12.6	336	48.3	15.1	11	41.7	10.4	54.3
05	255	00.4		12.7	351	22.4	15.1	11	31.3	10.4	54.3
06	270	00.3	N23	12.9	5	56.5	15.1	S11	20.9	10.5	54.4
M 07	285	00.2		13.0	20	30.6	15.1	11	10.4	10.5	54.4
I 08	300	00.0		13.1	35	04.7	15.1	10	59.9	10.6	54.4
E 09	314	59.9	. .	13.3	49	38.8	15.2	10	49.3	10.7	54.4
R 10	329	59.8		13.4	64	13.0	15.2	10	38.6	10.6	54.4
C 11	344	59.7		13.5	78	47.2	15.2	10	28.0	10.8	54.4
O 12	359	59.5	N23	13.7	93	21.4	15.3	S10	17.2	10.7	54.4
L 13	14	59.4		13.8	107	55.7	15.2	10	06.5	10.8	54.4
E 14	29	59.3		13.9	122	29.9	15.3	9	55.7	10.9	54.4
S 15	44	59.1	. .	14.1	137	04.2	15.3	9	44.8	10.9	54.5
16	59	59.0		14.2	151	38.5	15.3	9	33.9	10.9	54.5
17	74	58.9		14.3	166	12.8	15.3	9	23.0	11.0	54.5
18	89	58.7	N23	14.5	180	47.1	15.4	S 9	12.0	11.0	54.5
19	104	58.6		14.6	195	21.5	15.3	9	01.0	11.1	54.5
20	119	58.5		14.7	209	55.8	15.4	8	49.9	11.1	54.5
21	134	58.3	. .	14.9	224	30.2	15.4	8	38.8	11.1	54.5
22	149	58.2		15.0	239	04.6	15.4	8	27.7	11.2	54.6
23	164	58.1		15.1	253	39.0	15.4	8	16.5	11.3	54.6
14 00	179	57.9	N23	15.2	268	13.4	15.4	S 8	05.2	11.2	54.6
01	194	57.8		15.4	282	47.8	15.4	7	54.0	11.3	54.6
02	209	57.7		15.5	297	22.2	15.5	7	42.7	11.4	54.6
03	224	57.5	. .	15.6	311	56.7	15.4	7	31.3	11.3	54.6
04	239	57.4		15.7	326	31.1	15.5	7	20.0	11.4	54.6
05	254	57.3		15.9	341	05.6	15.4	7	08.6	11.5	54.7
06	269	57.1	N23	16.0	355	40.0	15.5	S 6	57.1	11.5	54.7
07	284	57.0		16.1	10	14.5	15.5	6	45.6	11.5	54.7
J 08	299	56.9		16.2	24	49.0	15.4	6	34.1	11.5	54.7
U 09	314	56.8	. .	16.3	39	23.4	15.5	6	22.6	11.6	54.7
E 10	329	56.6		16.5	53	57.9	15.5	6	11.0	11.6	54.7
11	344	56.5		16.6	68	32.4	15.5	5	59.4	11.6	54.8
V 12	359	56.4	N23	16.7	83	06.9	15.5	S 5	47.8	11.7	54.8
E 13	14	56.2		16.8	97	41.4	15.4	5	36.1	11.7	54.8
14	29	56.1		16.9	112	15.8	15.5	5	24.4	11.7	54.8
S 15	44	56.0	. .	17.0	126	50.3	15.5	5	12.7	11.8	54.8
16	59	55.8		17.2	141	24.8	15.5	5	00.9	11.8	54.9
17	74	55.7		17.3	155	59.3	15.4	4	49.1	11.8	54.9
18	89	55.6	N23	17.4	170	33.7	15.5	S 4	37.3	11.9	54.9
19	104	55.4		17.5	185	08.2	15.4	4	25.4	11.8	54.9
20	119	55.3		17.6	199	42.6	15.5	4	13.6	11.9	54.9
21	134	55.2	. .	17.7	214	17.1	15.4	4	01.7	12.0	55.0
22	149	55.0		17.8	228	51.5	15.4	3	49.7	11.9	55.0
23	164	54.9		17.9	243	25.9	15.5	S 3	37.8	12.0	55.0
	SD	15.8	d	0.1	SD		14.8		14.8		14.9

Lat.	Crepúsculo Náutico	Crepúsculo Civil	Orto Sol	Orto Luna 12	Orto Luna 13	Orto Luna 14	Orto Luna 15
°	h m	h m	h m	h m	h m	h m	h m
N 72	▭	▭	▭	02 52	02 15	01 51	01 31
N 70	▭	▭	▭	02 14	01 54	01 39	01 26
68	▭	▭	▭	01 48	01 38	01 30	01 23
66	▭	▭	▭	01 27	01 25	01 22	01 20
64	////	////	01 35	01 11	01 14	01 16	01 17
62	////	////	02 11	00 57	01 05	01 10	01 15
60	////	00 56	02 37	00 45	00 56	01 05	01 13
N 58	////	01 43	02 57	00 35	00 49	01 01	01 11
56	////	02 12	03 14	00 26	00 43	00 57	01 10
54	00 51	02 34	03 28	00 18	00 37	00 53	01 08
52	01 34	02 51	03 40	00 11	00 32	00 50	01 07
50	02 01	03 06	03 50	00 05	00 27	00 47	01 06
45	02 46	03 35	04 13	24 17	00 17	00 41	01 03
N 40	03 16	03 58	04 31	24 09	00 09	00 36	01 01
35	03 39	04 16	04 45	24 02	00 02	00 31	00 59
30	03 58	04 31	04 58	23 55	24 27	00 27	00 58
20	04 26	04 56	05 20	23 44	24 20	00 20	00 55
N 10	04 49	05 16	05 39	23 34	24 14	00 14	00 52
0	05 08	05 34	05 56	23 25	24 08	00 08	00 50
S 10	05 25	05 51	06 14	23 16	24 02	00 02	00 47
20	05 41	06 08	06 32	23 06	23 56	24 45	00 45
30	05 57	06 27	06 53	22 55	23 48	24 42	00 42
35	06 06	06 37	07 05	22 48	23 44	24 40	00 40
40	06 15	06 49	07 19	22 41	23 39	24 38	00 38
45	06 25	07 02	07 36	22 32	23 34	24 36	00 36
S 50	06 37	07 18	07 56	22 21	23 27	24 34	00 34
52	06 42	07 25	08 06	22 17	23 24	24 33	00 33
54	06 47	07 34	08 17	22 11	23 21	24 31	00 31
56	06 53	07 43	08 30	22 05	23 17	24 30	00 30
58	07 00	07 53	08 44	21 58	23 13	24 28	00 28
S 60	07 08	08 04	09 01	21 51	23 08	24 26	00 26

Lat.	Ocaso Sol	Crepúsculo Civil	Crepúsculo Náutico	Ocaso Luna 12	Ocaso Luna 13	Ocaso Luna 14	Ocaso Luna 15
°	h m	h m	h m	h m	h m	h m	h m
N 72	▭	▭	▭	07 10	09 17	11 10	12 59
N 70	▭	▭	▭	07 46	09 36	11 19	13 00
68	▭	▭	▭	08 11	09 51	11 26	13 01
66	▭	▭	▭	08 31	10 02	11 32	13 02
64	22 26	////	////	08 46	10 12	11 37	13 03
62	21 49	////	////	08 59	10 21	11 42	13 03
60	21 24	23 06	////	09 10	10 28	11 45	13 04
N 58	21 03	22 18	////	09 20	10 34	11 49	13 05
56	20 47	21 49	////	09 28	10 40	11 52	13 05
54	20 33	21 27	23 10	09 35	10 45	11 54	13 05
52	20 21	21 09	22 26	09 42	10 49	11 57	13 06
50	20 10	20 54	21 59	09 47	10 53	11 59	13 06
45	19 48	20 25	21 14	10 00	11 02	12 04	13 07
N 40	19 30	20 02	20 44	10 10	11 09	12 08	13 07
35	19 15	19 44	20 21	10 19	11 15	12 11	13 08
30	19 02	19 29	20 03	10 27	11 21	12 14	13 08
20	18 40	19 05	19 34	10 40	11 30	12 19	13 09
N 10	18 21	18 44	19 11	10 52	11 38	12 24	13 10
0	18 04	18 26	18 52	11 03	11 46	12 28	13 10
S 10	17 46	18 09	18 36	11 14	11 53	12 32	13 11
20	17 28	17 52	18 19	11 25	12 01	12 36	13 11
30	17 07	17 33	18 03	11 38	12 10	12 41	13 12
35	16 55	17 23	17 54	11 45	12 16	12 44	13 12
40	16 41	17 11	17 45	11 54	12 22	12 47	13 13
45	16 24	16 58	17 35	12 04	12 28	12 51	13 13
S 50	16 03	16 42	17 23	12 15	12 36	12 55	13 14
52	15 54	16 34	17 18	12 21	12 40	12 57	13 14
54	15 43	16 26	17 13	12 27	12 44	13 00	13 14
56	15 30	16 17	17 06	12 34	12 49	13 02	13 14
58	15 16	16 07	17 00	12 41	12 54	13 05	13 15
S 60	14 58	15 56	16 52	12 50	12 59	13 08	13 15

Día	SOL E.T. (+) (−) 00h	SOL E.T. (+) (−) 12h	SOL Pas. Mer.	LUNA Pas. Mer. Sup.	LUNA Pas. Mer. Inf.	LUNA Edad	LUNA Fase
d	m s	m s	h m	h m	h m	c	%
12	00 17	00 11	12 00	04 52	17 14	20	66
13	00 05	00 02	12 00	05 36	17 57	21	56
14	00 08	00 14	12 00	06 18	18 39	22	47

T.U.	ARIES	VENUS −4.2		MARTE −2.3		JUPITER −1.9		SATURNO +0.1	
	A.H.G.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
18 00	266 17.9	226 29.4	N12 37.9	5 56.3	S26 38.9	182 28.6	N23 00.3	200 26.8	N19 52.7
01	281 20.4	241 29.4	38.6	20 59.7	39.0	197 30.4	00.3	215 28.9	52.7
02	296 22.9	256 29.3	39.3	36 03.0	39.0	212 32.3	00.3	230 31.0	52.8
03	311 25.3	271 29.3 . .	40.1	51 06.4 . .	39.1	227 34.1 . .	00.3	245 33.2 . .	52.8
04	326 27.8	286 29.3	40.8	66 09.8	39.2	242 36.0	00.4	260 35.3	52.9
05	341 30.3	301 29.3	41.6	81 13.2	39.2	257 37.8	00.4	275 37.4	52.9
06	356 32.7	316 29.2	N12 42.3	96 16.6	S26 39.3	272 39.6	N23 00.4	290 39.6	N19 53.0
07	11 35.2	331 29.2	43.0	111 19.9	39.4	287 41.5	00.5	305 41.7	53.0
08	26 37.7	346 29.2	43.8	126 23.3	39.5	302 43.3	00.5	320 43.8	53.1
L 09	41 40.1	1 29.2 . .	44.5	141 26.7 . .	39.5	317 45.1 . .	00.5	335 46.0 . .	53.1
U 10	56 42.6	16 29.1	45.3	156 30.1	39.6	332 47.0	00.5	350 48.1	53.2
11	71 45.0	31 29.1	46.0	171 33.4	39.7	347 48.8	00.6	5 50.3	53.2
N 12	86 47.5	46 29.1	N12 46.7	186 36.8	S26 39.7	2 50.7	N23 00.6	20 52.4	N19 53.3
E 13	101 50.0	61 29.0	47.5	201 40.2	39.8	17 52.5	00.6	35 54.5	53.3
14	116 52.4	76 29.0	48.2	216 43.6	39.9	32 54.3	00.6	50 56.7	53.4
S 15	131 54.9	91 29.0 . .	48.9	231 47.0 . .	39.9	47 56.2 . .	00.7	65 58.8 . .	53.5
16	146 57.4	106 28.9	49.7	246 50.3	40.0	62 58.0	00.7	81 00.9	53.5
17	161 59.8	121 28.9	50.4	261 53.7	40.1	77 59.9	00.7	96 03.1	53.6
18	177 02.3	136 28.9	N12 51.2	276 57.1	S26 40.1	93 01.7	N23 00.8	111 05.2	N19 53.6
19	192 04.8	151 28.8	51.9	292 00.5	40.2	108 03.5	00.8	126 07.4	53.7
20	207 07.2	166 28.8	52.6	307 03.8	40.3	123 05.4	00.8	141 09.5	53.7
21	222 09.7	181 28.8 . .	53.4	322 07.2 . .	40.3	138 07.2 . .	00.8	156 11.6 . .	53.8
22	237 12.2	196 28.7	54.1	337 10.6	40.4	153 09.0	00.9	171 13.8	53.8
23	252 14.6	211 28.7	54.8	352 14.0	40.5	168 10.9	00.9	186 15.9	53.9
19 00	267 17.1	226 28.6	N12 55.6	7 17.3	S26 40.5	183 12.7	N23 00.9	201 18.1	N19 53.9
01	282 19.5	241 28.6	56.3	22 20.7	40.6	198 14.6	01.0	216 20.2	54.0
02	297 22.0	256 28.6	57.1	37 24.1	40.7	213 16.4	01.0	231 22.3	54.0
03	312 24.5	271 28.5 . .	57.8	52 27.5 . .	40.7	228 18.2 . .	01.0	246 24.5 . .	54.1
04	327 26.9	286 28.5	58.5	67 30.8	40.8	243 20.1	01.0	261 26.6	54.1
05	342 29.4	301 28.4	12 59.3	82 34.2	40.8	258 21.9	01.1	276 28.7	54.2
06	357 31.9	316 28.4	N13 00.0	97 37.6	S26 40.9	273 23.8	N23 01.1	291 30.9	N19 54.2
07	12 34.3	331 28.3	00.7	112 40.9	41.0	288 25.6	01.1	306 33.0	54.3
M 08	27 36.8	346 28.3	01.5	127 44.3	41.0	303 27.4	01.1	321 35.2	54.3
A 09	42 39.3	1 28.2 . .	02.2	142 47.7 . .	41.1	318 29.3 . .	01.2	336 37.3 . .	54.4
R 10	57 41.7	16 28.2	02.9	157 51.1	41.2	333 31.1	01.2	351 39.4	54.4
11	72 44.2	31 28.2	03.7	172 54.4	41.2	348 33.0	01.2	6 41.6	54.5
T 12	87 46.7	46 28.1	N13 04.4	187 57.8	S26 41.3	3 34.8	N23 01.3	21 43.7	N19 54.5
13	102 49.1	61 28.1	05.2	203 01.2	41.4	18 36.6	01.3	36 45.8	54.6
E 14	117 51.6	76 28.0	05.9	218 04.6	41.4	33 38.5	01.3	51 48.0	54.6
15	132 54.0	91 28.0 . .	06.6	233 07.9 . .	41.5	48 40.3 . .	01.3	66 50.1 . .	54.7
S 16	147 56.5	106 27.9	07.4	248 11.3	41.5	63 42.1	01.4	81 52.3	54.7
17	162 59.0	121 27.9	08.1	263 14.7	41.6	78 44.0	01.4	96 54.4	54.8
18	178 01.4	136 27.8	N13 08.8	278 18.0	S26 41.7	93 45.8	N23 01.4	111 56.5	N19 54.8
19	193 03.9	151 27.8	09.6	293 21.4	41.7	108 47.7	01.4	126 58.7	54.9
20	208 06.4	166 27.7	10.3	308 24.8	41.8	123 49.5	01.5	142 00.8	54.9
21	223 08.8	181 27.6 . .	11.0	323 28.1 . .	41.8	138 51.3 . .	01.5	157 03.0 . .	55.0
22	238 11.3	196 27.6	11.8	338 31.5	41.9	153 53.2	01.5	172 05.1	55.0
23	253 13.8	211 27.5	12.5	353 34.9	42.0	168 55.0	01.5	187 07.2	55.1
20 00	268 16.2	226 27.5	N13 13.2	8 38.2	S26 42.0	183 56.9	N23 01.6	202 09.4	N19 55.1
01	283 18.7	241 27.4	14.0	23 41.6	42.1	198 58.7	01.6	217 11.5	55.2
02	298 21.1	256 27.4	14.7	38 45.0	42.1	214 00.5	01.6	232 13.7	55.2
03	313 23.6	271 27.3 . .	15.4	53 48.4 . .	42.2	229 02.4 . .	01.7	247 15.8 . .	55.3
04	328 26.1	286 27.3	16.2	68 51.7	42.3	244 04.2	01.7	262 17.9	55.3
05	343 28.5	301 27.2	16.9	83 55.1	42.3	259 06.1	01.7	277 20.1	55.4
06	358 31.0	316 27.1	N13 17.6	98 58.5	S26 42.4	274 07.9	N23 01.7	292 22.2	N19 55.4
M 07	13 33.5	331 27.1	18.4	114 01.8	42.4	289 09.7	01.8	307 24.3	55.5
I 08	28 35.9	346 27.0	19.1	129 05.2	42.5	304 11.6	01.8	322 26.5	55.5
E 09	43 38.4	1 26.9 . .	19.8	144 08.5 . .	42.6	319 13.4 . .	01.8	337 28.6 . .	55.6
R 10	58 40.9	16 26.9	20.6	159 11.9	42.6	334 15.2	01.8	352 30.8	55.6
C 11	73 43.3	31 26.8	21.3	174 15.3	42.7	349 17.1	01.9	7 32.9	55.7
O 12	88 45.8	46 26.8	N13 22.0	189 18.6	S26 42.7	4 18.9	N23 01.9	22 35.0	N19 55.7
L 13	103 48.3	61 26.7	22.8	204 22.0	42.8	19 20.8	01.9	37 37.2	55.8
E 14	118 50.7	76 26.6	23.5	219 25.4	42.8	34 22.6	01.9	52 39.3	55.8
S 15	133 53.2	91 26.6 . .	24.2	234 28.7 . .	42.9	49 24.4 . .	02.0	67 41.5 . .	55.9
16	148 55.6	106 26.5	25.0	249 32.1	43.0	64 26.3	02.0	82 43.6	55.9
17	163 58.1	121 26.4	25.7	264 35.5	43.0	79 28.1	02.0	97 45.7	56.0
18	179 00.6	136 26.4	N13 26.4	279 38.8	S26 43.1	94 30.0	N23 02.0	112 47.9	N19 56.0
19	194 03.0	151 26.3	27.2	294 42.2	43.1	109 31.8	02.1	127 50.0	56.1
20	209 05.5	166 26.2	27.9	309 45.5	43.2	124 33.6	02.1	142 52.2	56.1
21	224 08.0	181 26.2 . .	28.6	324 48.9 . .	43.2	139 35.5 . .	02.1	157 54.3 . .	56.2
22	239 10.4	196 26.1	29.4	339 52.3	43.3	154 37.3	02.1	172 56.4	56.2
23	254 12.9	211 26.0	30.1	354 55.6	43.3	169 39.2	02.2	187 58.6	56.3
	h m								
Pas. Mer.	6 09.8	*v* 0.0	*d* 0.7	*v* 3.4	*d* 0.1	*v* 1.8	*d* 0.0	*v* 2.1	*d* 0.1

ESTRELLAS

Nombre	A.H.S. ° ′	Dec. ° ′
Acamar	315 25.8	S40 17.9
Achernar	335 34.0	S57 13.6
Acrux	173 19.9	S63 06.6
Adhara	255 20.3	S28 58.5
Aldebaran	291 00.6	N16 30.6
Alioth	166 28.7	N55 57.5
Alkaid	153 06.0	N49 18.7
Al Na'ir	27 55.3	S46 57.1
Alnilam	275 56.3	S 1 12.1
Alphard	218 05.6	S 8 39.9
Alphecca	126 18.7	N26 42.8
Alpheratz	357 53.3	N29 05.6
Altair	62 17.1	N 8 52.3
Ankaa	353 25.0	S42 17.8
Antares	112 37.5	S26 26.1
Arcturus	146 04.1	N19 10.7
Atria	107 47.3	S69 01.8
Avior	234 22.4	S59 31.0
Bellatrix	278 42.5	N 6 21.0
Betelgeuse	271 11.9	N 7 24.4
Canopus	264 00.9	S52 41.8
Capella	280 48.9	N45 59.9
Deneb	49 37.6	N45 16.9
Denebola	182 43.3	N14 34.0
Diphda	349 05.4	S17 58.7
Dubhe	194 03.3	N61 45.0
Elnath	278 24.9	N28 36.4
Eltanin	90 50.0	N51 29.4
Enif	33 56.2	N 9 52.8
Fomalhaut	15 34.2	S29 36.8
Gacrux	172 11.4	S57 07.4
Gienah	176 02.0	S17 33.0
Hadar	149 01.0	S60 22.9
Hamal	328 11.6	N23 27.9
Kaus Aust.	83 55.9	S34 23.0
Kochab	137 18.7	N74 09.3
Markab	13 47.7	N15 12.6
Menkar	314 25.2	N 4 05.6
Menkent	148 18.5	S36 22.7
Miaplacidus	221 42.4	S69 43.6
Mirfak	308 54.4	N49 51.7
Nunki	76 09.6	S26 17.7
Peacock	53 33.5	S56 43.7
Pollux	243 39.6	N28 01.5
Procyon	245 09.9	N 5 13.3
Rasalhague	96 14.9	N12 33.6
Regulus	207 53.7	N11 57.7
Rigel	281 21.5	S 8 12.0
Rigil Kent.	140 04.4	S60 50.6
Sabik	102 23.0	S15 43.6
Schedar	349 51.5	N56 32.3
Shaula	96 34.3	S37 06.3
Sirius	258 42.4	S16 43.1
Spica	158 41.1	S11 10.1
Suhail	222 59.7	S43 26.4
Vega	80 44.9	N38 47.1
Zuben'ubi	137 15.6	S16 02.8

	A.H.S. ° ′	Pas. Mer. h m
Venus	319 11.6	8 54
Marte	100 00.3	23 26
Júpiter	275 55.6	11 46
Saturno	294 01.0	10 33

T.U.	SOL				LUNA						
	A.H.G.		Dec.		A.H.G.	v		Dec.	d	P.H.	
d h	°	′	°	′	°	′	′	°	′	′	′
LUNES 18 00	179	45.0	N23	24.0	225	45.8	11.9	N11	12.6	11.6	57.2
01	194	44.9		24.1	240	16.7	11.9	11	24.2	11.6	57.2
02	209	44.7		24.1	254	47.6	11.7	11	35.8	11.6	57.2
03	224	44.6	. .	24.2	269	18.3	11.7	11	47.4	11.5	57.3
04	239	44.5		24.3	283	49.0	11.6	11	58.9	11.5	57.3
05	254	44.3		24.3	298	19.6	11.5	12	10.4	11.4	57.3
06	269	44.2	N23	24.4	312	50.1	11.4	N12	21.8	11.4	57.4
07	284	44.1		24.4	327	20.5	11.3	12	33.2	11.3	57.4
08	299	43.9		24.5	341	50.8	11.3	12	44.5	11.3	57.5
09	314	43.8	. .	24.5	356	21.1	11.1	12	55.8	11.2	57.5
10	329	43.6		24.6	10	51.2	11.1	13	07.0	11.2	57.5
11	344	43.5		24.6	25	21.3	10.9	13	18.2	11.1	57.6
12	359	43.4	N23	24.7	39	51.2	10.9	N13	29.3	11.1	57.6
13	14	43.2		24.7	54	21.1	10.8	13	40.4	11.0	57.6
14	29	43.1		24.8	68	50.9	10.7	13	51.4	10.9	57.7
15	44	43.0	. .	24.8	83	20.6	10.5	14	02.3	10.9	57.7
16	59	42.8		24.9	97	50.1	10.5	14	13.2	10.9	57.7
17	74	42.7		24.9	112	19.6	10.4	14	24.1	10.7	57.8
18	89	42.6	N23	24.9	126	49.0	10.3	N14	34.8	10.7	57.8
19	104	42.4		25.0	141	18.3	10.2	14	45.5	10.7	57.8
20	119	42.3		25.0	155	47.5	10.1	14	56.2	10.6	57.9
21	134	42.1	. .	25.1	170	16.6	10.0	15	06.8	10.5	57.9
22	149	42.0		25.1	184	45.6	9.9	15	17.3	10.4	57.9
23	164	41.9		25.2	199	14.5	9.9	15	27.7	10.4	58.0
MARTES 19 00	179	41.7	N23	25.2	213	43.4	9.7	N15	38.1	10.3	58.0
01	194	41.6		25.2	228	12.1	9.6	15	48.4	10.2	58.0
02	209	41.5		25.3	242	40.7	9.5	15	58.6	10.1	58.1
03	224	41.3	. .	25.3	257	09.2	9.4	16	08.7	10.1	58.1
04	239	41.2		25.3	271	37.6	9.3	16	18.8	10.0	58.2
05	254	41.0		25.4	286	05.9	9.2	16	28.8	9.9	58.2
06	269	40.9	N23	25.4	300	34.1	9.1	N16	38.7	9.8	58.2
07	284	40.8		25.5	315	02.2	9.0	16	48.5	9.8	58.3
08	299	40.6		25.5	329	30.2	8.9	16	58.3	9.6	58.3
09	314	40.5	. .	25.5	343	58.1	8.8	17	07.9	9.6	58.3
10	329	40.4		25.6	358	25.9	8.7	17	17.5	9.5	58.4
11	344	40.2		25.6	12	53.6	8.6	17	27.0	9.4	58.4
12	359	40.1	N23	25.6	27	21.2	8.5	N17	36.4	9.3	58.4
13	14	39.9		25.7	41	48.7	8.4	17	45.7	9.2	58.5
14	29	39.8		25.7	56	16.1	8.3	17	54.9	9.1	58.5
15	44	39.7	. .	25.7	70	43.4	8.1	18	04.0	9.0	58.5
16	59	39.5		25.7	85	10.5	8.1	18	13.0	8.9	58.6
17	74	39.4		25.8	99	37.6	8.0	18	21.9	8.9	58.6
18	89	39.3	N23	25.8	114	04.6	7.9	N18	30.8	8.7	58.6
19	104	39.1		25.8	128	31.5	7.8	18	39.5	8.6	58.7
20	119	39.0		25.9	142	58.3	7.6	18	48.1	8.5	58.7
21	134	38.8	. .	25.9	157	24.9	7.6	18	56.6	8.4	58.7
22	149	38.7		25.9	171	51.5	7.5	19	05.0	8.4	58.8
23	164	38.6		25.9	186	18.0	7.3	19	13.4	8.2	58.8
MIERCOLES 20 00	179	38.4	N23	25.9	200	44.3	7.3	N19	21.6	8.0	58.8
01	194	38.3		26.0	215	10.6	7.2	19	29.6	8.0	58.9
02	209	38.2		26.0	229	36.8	7.0	19	37.6	7.9	58.9
03	224	38.0	. .	26.0	244	02.8	7.0	19	45.5	7.7	58.9
04	239	37.9		26.0	258	28.8	6.9	19	53.2	7.7	58.9
05	254	37.7		26.1	272	54.7	6.7	20	00.9	7.5	59.0
06	269	37.6	N23	26.1	287	20.4	6.7	N20	08.4	7.4	59.0
07	284	37.5		26.1	301	46.1	6.6	20	15.8	7.3	59.0
08	299	37.3		26.1	316	11.7	6.4	20	23.1	7.1	59.1
09	314	37.2	. .	26.1	330	37.1	6.4	20	30.2	7.1	59.1
10	329	37.1		26.1	345	02.5	6.3	20	37.3	6.9	59.1
11	344	36.9		26.2	359	27.8	6.2	20	44.2	6.8	59.2
12	359	36.8	N23	26.2	13	53.0	6.1	N20	51.0	6.6	59.2
13	14	36.6		26.2	28	18.1	6.0	20	57.6	6.5	59.2
14	29	36.5		26.2	42	43.1	5.9	21	04.1	6.4	59.2
15	44	36.4	. .	26.2	57	08.0	5.8	21	10.5	6.3	59.3
16	59	36.2		26.2	71	32.8	5.8	21	16.8	6.1	59.3
17	74	36.1		26.2	85	57.6	5.6	21	22.9	6.0	59.3
18	89	36.0	N23	26.2	100	22.2	5.6	N21	28.9	5.9	59.4
19	104	35.8		26.3	114	46.8	5.4	21	34.8	5.7	59.4
20	119	35.7		26.3	129	11.2	5.4	21	40.5	5.6	59.4
21	134	35.6	. .	26.3	143	35.6	5.3	21	46.1	5.4	59.4
22	149	35.4		26.3	157	59.9	5.3	21	51.5	5.3	59.5
23	164	35.3		26.3	172	24.2	5.1	N21	56.8	5.2	59.5
	SD	15.8	d	0.0	SD		15.7		15.9		16.1

Lat.	Crepúsculo Náutico	Crepúsculo Civil	Orto Sol	Orto Luna 18	Orto Luna 19	Orto Luna 20	Orto Luna 21
°	h m	h m	h m	h m	h m	h m	h m
N 72	▭	▭	▭	{ 00 28 / 23 51 }	▭	▭	▭
N 70	▭	▭	▭	00 46	{ 00 26 / 23 45 }	▭	▭
68	▭	▭	▭	01 01	00 51	{ 00 38 / 23 58 }	▭
66	▭	▭	▭	01 13	01 11	01 11	01 16
64	////	////	01 31	01 23	01 27	01 35	01 53
62	////	////	02 09	01 31	01 40	01 55	02 20
60	////	00 49	02 35	01 38	01 52	02 11	02 41
N 58	////	01 40	02 56	01 45	02 01	02 24	02 58
56	////	02 10	03 13	01 51	02 10	02 36	03 12
54	00 45	02 32	03 27	01 56	02 18	02 46	03 25
52	01 32	02 50	03 39	02 01	02 25	02 55	03 36
50	02 00	03 06	03 50	02 05	02 31	03 04	03 46
45	02 46	03 35	04 13	02 14	02 45	03 21	04 07
N 40	03 16	03 58	04 31	02 22	02 56	03 36	04 23
35	03 39	04 16	04 46	02 29	03 05	03 48	04 38
30	03 58	04 32	04 59	02 35	03 14	03 59	04 50
20	04 27	04 56	05 21	02 45	03 29	04 17	05 11
N 10	04 50	05 17	05 40	02 55	03 42	04 33	05 30
0	05 09	05 35	05 58	03 03	03 54	04 49	05 47
S 10	05 26	05 52	06 15	03 12	04 06	05 04	06 05
20	05 42	06 10	06 34	03 22	04 19	05 20	06 24
30	05 59	06 29	06 55	03 32	04 35	05 39	06 45
35	06 07	06 39	07 07	03 39	04 43	05 51	06 58
40	06 17	06 51	07 21	03 46	04 54	06 03	07 13
45	06 27	07 04	07 38	03 54	05 06	06 19	07 30
S 50	06 39	07 21	07 59	04 04	05 20	06 37	07 52
52	06 44	07 28	08 09	04 09	05 27	06 46	08 03
54	06 50	07 36	08 20	04 14	05 35	06 56	08 14
56	06 56	07 45	08 33	04 20	05 43	07 07	08 28
58	07 03	07 56	08 48	04 27	05 53	07 20	08 43
S 60	07 10	08 07	09 05	04 34	06 04	07 36	09 02

Lat.	Ocaso Sol	Crepúsculo Civil	Crepúsculo Náutico	Ocaso Luna 18	Ocaso Luna 19	Ocaso Luna 20	Ocaso Luna 21
°	h m	h m	h m	h m	h m	h m	h m
N 72	▭	▭	▭	19 09	▭	▭	▭
N 70	▭	▭	▭	18 36	21 08	▭	▭
68	▭	▭	▭	18 12	20 16	22 57	▭
66	▭	▭	▭	17 54	19 44	21 40	23 26
64	22 32	////	////	17 39	19 21	21 03	22 32
62	21 54	////	////	17 26	19 02	20 37	22 00
60	21 27	23 14	////	17 16	18 47	20 16	21 36
N 58	21 07	22 23	////	17 07	18 34	20 00	21 17
56	20 50	21 53	////	16 59	18 23	19 45	21 01
54	20 36	21 30	23 18	16 52	18 13	19 33	20 47
52	20 23	21 12	22 31	16 46	18 04	19 22	20 35
50	20 12	20 57	22 03	16 40	17 57	19 13	20 24
45	19 50	20 27	21 17	16 28	17 40	18 53	20 02
N 40	19 32	20 05	20 46	16 18	17 27	18 36	19 44
35	19 17	19 46	20 23	16 09	17 15	18 23	19 29
30	19 04	19 31	20 05	16 02	17 05	18 11	19 16
20	18 42	19 06	19 35	15 49	16 48	17 50	18 54
N 10	18 23	18 46	19 13	15 38	16 33	17 33	18 35
0	18 05	18 28	18 54	15 27	16 19	17 16	18 17
S 10	17 48	18 10	18 37	15 16	16 06	17 00	17 59
20	17 29	17 53	18 21	15 05	15 51	16 42	17 39
30	17 08	17 34	18 04	14 53	15 34	16 22	17 17
35	16 55	17 24	17 55	14 45	15 24	16 10	17 04
40	16 41	17 12	17 46	14 37	15 13	15 56	16 49
45	16 24	16 58	17 35	14 27	15 00	15 41	16 31
S 50	16 04	16 42	17 24	14 16	14 44	15 21	16 09
52	15 54	16 35	17 18	14 10	14 37	15 12	15 58
54	15 43	16 26	17 13	14 04	14 29	15 01	15 46
56	15 30	16 17	17 06	13 58	14 20	14 50	15 33
58	15 15	16 07	17 00	13 50	14 09	14 36	15 17
S 60	14 58	15 55	16 52	13 42	13 57	14 20	14 58

Día	SOL E.T. (−) 00h	SOL E.T. (−) 12h	SOL Pas. Mer.	LUNA Pas. Sup.	LUNA Mer. Inf.	LUNA Edad	LUNA Fase
d	m s	m s	h m	h m	h m	d	%
18	01 00	01 06	12 01	09 15	21 40	26	11
19	01 13	01 19	12 01	10 07	22 34	27	5
20	01 26	01 33	12 02	11 02	23 32	28	1

T.U.	ARIES	VENUS −4.2		MARTE −2.3		JUPITER −1.9		SATURNO +0.1		ESTRELLAS		
	A.H.G.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.	Nombre	A.H.S.	Dec.
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′		° ′	° ′
21 00	269 15.4	226 25.9	N13 30.8	9 59.0	S26 43.4	184 41.0	N23 02.2	203 00.7	N19 56.3	Acamar	315 25.8	S40 17.9
01	284 17.8	241 25.9	31.5	25 02.3	43.5	199 42.8	02.2	218 02.9	56.4	Achernar	335 33.9	S57 13.6
02	299 20.3	256 25.8	32.3	40 05.7	43.5	214 44.7	02.2	233 05.0	56.4	Acrux	173 19.9	S63 06.6
03	314 22.8	271 25.7	33.0	55 09.0	43.6	229 46.5	02.3	248 07.1	56.4	Adhara	255 20.3	S28 58.5
04	329 25.2	286 25.6	33.7	70 12.4	43.6	244 48.4	02.3	263 09.3	56.5	Aldebaran	291 00.5	N16 30.6
05	344 27.7	301 25.6	34.5	85 15.8	43.7	259 50.2	02.3	278 11.4	56.5			
06	359 30.1	316 25.5	N13 35.2	100 19.1	S26 43.7	274 52.0	N23 02.3	293 13.6	N19 56.6	Alioth	166 28.7	N55 57.5
07	14 32.6	331 25.4	35.9	115 22.5	43.8	289 53.9	02.4	308 15.7	56.6	Alkaid	153 06.0	N49 18.7
J 08	29 35.1	346 25.3	36.7	130 25.8	43.8	304 55.7	02.4	323 17.8	56.7	Al Na'ir	27 55.2	S46 57.1
U 09	44 37.5	1 25.3	37.4	145 29.2	43.9	319 57.6	02.4	338 20.0	56.7	Alnilam	275 56.3	S 1 12.1
E 10	59 40.0	16 25.2	38.1	160 32.5	43.9	334 59.4	02.4	353 22.1	56.8	Alphard	218 05.6	S 8 39.9
11	74 42.5	31 25.1	38.8	175 35.9	44.0	350 01.2	02.5	8 24.3	56.8			
V 12	89 44.9	46 25.0	N13 39.6	190 39.2	S26 44.0	5 03.1	N23 02.5	23 26.4	N19 56.9	Alphecca	126 18.7	N26 42.8
13	104 47.4	61 24.9	40.3	205 42.6	44.1	20 04.9	02.5	38 28.5	56.9	Alpheratz	357 53.3	N29 05.6
E 14	119 49.9	76 24.9	41.0	220 46.0	44.1	35 06.7	02.5	53 30.7	57.0	Altair	62 17.1	N 8 52.3
15	134 52.3	91 24.8	41.8	235 49.3	44.2	50 08.6	02.6	68 32.8	57.0	Ankaa	353 25.0	S42 17.8
S 16	149 54.8	106 24.7	42.5	250 52.7	44.2	65 10.4	02.6	83 35.0	57.1	Antares	112 37.5	S26 26.1
17	164 57.3	121 24.6	43.2	265 56.0	44.3	80 12.3	02.6	98 37.1	57.1			
18	179 59.7	136 24.5	N13 43.9	280 59.4	S26 44.3	95 14.1	N23 02.6	113 39.2	N19 57.2	Arcturus	146 04.1	N19 10.7
19	195 02.2	151 24.4	44.7	296 02.7	44.4	110 15.9	02.7	128 41.4	57.2	Atria	107 47.3	S69 01.9
20	210 04.6	166 24.4	45.4	311 06.1	44.4	125 17.8	02.7	143 43.5	57.3	Avior	234 22.5	S59 31.0
21	225 07.1	181 24.3	46.1	326 09.4	44.5	140 19.6	02.7	158 45.7	57.3	Bellatrix	278 42.5	N 6 21.0
22	240 09.6	196 24.2	46.9	341 12.8	44.5	155 21.5	02.7	173 47.8	57.4	Betelgeuse	271 11.8	N 7 24.4
23	255 12.0	211 24.1	47.6	356 16.1	44.6	170 23.3	02.8	188 50.0	57.4			
22 00	270 14.5	226 24.0	N13 48.3	11 19.5	S26 44.6	185 25.1	N23 02.8	203 52.1	N19 57.5	Canopus	264 00.9	S52 41.8
01	285 17.0	241 23.9	49.0	26 22.8	44.7	200 27.0	02.8	218 54.2	57.5	Capella	280 48.9	N45 59.9
02	300 19.4	256 23.8	49.8	41 26.1	44.7	215 28.8	02.8	233 56.4	57.6	Deneb	49 37.6	N45 16.9
03	315 21.9	271 23.7	50.5	56 29.5	44.8	230 30.7	02.9	248 58.5	57.6	Denebola	182 43.3	N14 34.0
04	330 24.4	286 23.6	51.2	71 32.8	44.8	245 32.5	02.9	264 00.7	57.7	Diphda	349 05.4	S17 58.7
05	345 26.8	301 23.6	51.9	86 36.2	44.9	260 34.3	02.9	279 02.8	57.7			
06	0 29.3	316 23.5	N13 52.7	101 39.5	S26 44.9	275 36.2	N23 02.9	294 04.9	N19 57.8	Dubhe	194 03.3	N61 45.0
07	15 31.8	331 23.4	53.4	116 42.9	45.0	290 38.0	03.0	309 07.1	57.8	Elnath	278 24.9	N28 36.4
V 08	30 34.2	346 23.3	54.1	131 46.2	45.0	305 39.9	03.0	324 09.2	57.9	Eltanin	90 50.0	N51 29.4
I 09	45 36.7	1 23.2	54.8	146 49.6	45.1	320 41.7	03.0	339 11.4	57.9	Enif	33 56.2	N 9 52.8
E 10	60 39.1	16 23.1	55.6	161 52.9	45.1	335 43.5	03.0	354 13.5	58.0	Fomalhaut	15 34.2	S29 36.8
R 11	75 41.6	31 23.0	56.3	176 56.2	45.2	350 45.4	03.1	9 15.7	58.0			
N 12	90 44.1	46 22.9	N13 57.0	191 59.6	S26 45.2	5 47.2	N23 03.1	24 17.8	N19 58.1	Gacrux	172 11.4	S57 07.4
E 13	105 46.5	61 22.8	57.7	207 02.9	45.3	20 49.1	03.1	39 19.9	58.1	Gienah	176 02.0	S17 33.0
S 14	120 49.0	76 22.7	58.5	222 06.3	45.3	35 50.9	03.1	54 22.1	58.2	Hadar	149 01.1	S60 22.9
15	135 51.5	91 22.6	59.2	237 09.6	45.4	50 52.7	03.2	69 24.2	58.2	Hamal	328 11.6	N23 27.9
16	150 53.9	106 22.5	13 59.9	252 12.9	45.4	65 54.6	03.2	84 26.4	58.3	Kaus Aust.	83 55.9	S34 23.0
17	165 56.4	121 22.4	14 00.6	267 16.3	45.5	80 56.4	03.2	99 28.5	58.3			
18	180 58.9	136 22.3	N14 01.4	282 19.6	S26 45.5	95 58.3	N23 03.2	114 30.6	N19 58.4	Kochab	137 18.7	N74 09.3
19	196 01.3	151 22.2	02.1	297 23.0	45.5	111 00.1	03.3	129 32.8	58.4	Markab	13 47.6	N15 12.6
20	211 03.8	166 22.1	02.8	312 26.3	45.6	126 01.9	03.3	144 34.9	58.5	Menkar	314 25.2	N 4 05.6
21	226 06.3	181 22.0	03.5	327 29.6	45.6	141 03.8	03.3	159 37.1	58.5	Menkent	148 18.5	S36 22.7
22	241 08.7	196 21.9	04.3	342 33.0	45.7	156 05.6	03.3	174 39.2	58.5	Miaplacidus	221 42.4	S69 43.6
23	256 11.2	211 21.8	05.0	357 36.3	45.7	171 07.5	03.3	189 41.4	58.6			
23 00	271 13.6	226 21.7	N14 05.7	12 39.6	S26 45.8	186 09.3	N23 03.4	204 43.5	N19 58.6	Mirfak	308 54.3	N49 51.7
01	286 16.1	241 21.6	06.4	27 43.0	45.8	201 11.1	03.4	219 45.6	58.7	Nunki	76 09.6	S26 17.7
02	301 18.6	256 21.5	07.1	42 46.3	45.9	216 13.0	03.4	234 47.8	58.7	Peacock	53 33.5	S56 43.7
03	316 21.0	271 21.4	07.9	57 49.6	45.9	231 14.8	03.4	249 49.9	58.8	Pollux	243 39.6	N28 01.4
04	331 23.5	286 21.3	08.6	72 53.0	45.9	246 16.7	03.5	264 52.1	58.8	Procyon	245 09.9	N 5 13.3
05	346 26.0	301 21.2	09.3	87 56.3	46.0	261 18.5	03.5	279 54.2	58.9			
06	1 28.4	316 21.1	N14 10.0	102 59.6	S26 46.0	276 20.3	N23 03.5	294 56.4	N19 58.9	Rasalhague	96 14.8	N12 33.6
07	16 30.9	331 20.9	10.8	118 02.9	46.1	291 22.2	03.5	309 58.5	59.0	Regulus	207 53.7	N11 57.7
S 08	31 33.4	346 20.8	11.5	133 06.3	46.1	306 24.0	03.6	325 00.6	59.0	Rigel	281 21.4	S 8 12.0
A 09	46 35.8	1 20.7	12.2	148 09.6	46.2	321 25.9	03.6	340 02.8	59.1	Rigil Kent.	140 04.4	S60 50.6
B 10	61 38.3	16 20.6	12.9	163 12.9	46.2	336 27.7	03.6	355 04.9	59.1	Sabik	102 23.0	S15 43.6
11	76 40.8	31 20.5	13.6	178 16.3	46.2	351 29.5	03.6	10 07.1	59.2			
A 12	91 43.2	46 20.4	N14 14.4	193 19.6	S26 46.3	6 31.4	N23 03.6	25 09.2	N19 59.2	Schedar	349 51.5	N56 32.3
13	106 45.7	61 20.3	15.1	208 22.9	46.3	21 33.2	03.7	40 11.4	59.3	Shaula	96 34.3	S37 06.3
D 14	121 48.1	76 20.2	15.8	223 26.2	46.4	36 35.1	03.7	55 13.5	59.3	Sirius	258 42.4	S16 43.1
15	136 50.6	91 20.1	16.5	238 29.6	46.4	51 36.9	03.7	70 15.6	59.4	Spica	158 41.1	S11 10.1
O 16	151 53.1	106 19.9	17.2	253 32.9	46.4	66 38.7	03.7	85 17.8	59.4	Suhail	222 59.7	S43 26.4
17	166 55.5	121 19.8	18.0	268 36.2	46.5	81 40.6	03.8	100 19.9	59.5			
18	181 58.0	136 19.7	N14 18.7	283 39.5	S26 46.5	96 42.4	N23 03.8	115 22.1	N19 59.5	Vega	80 44.9	N38 47.1
19	197 00.5	151 19.6	19.4	298 42.9	46.6	111 44.3	03.8	130 24.2	59.6	Zuben'ubi	137 15.6	S16 02.8
20	212 02.9	166 19.5	20.1	313 46.2	46.6	126 46.1	03.8	145 26.4	59.6			
21	227 05.4	181 19.4	20.8	328 49.5	46.7	141 47.9	03.9	160 28.5	59.7		A.H.S.	Pas. Mer.
22	242 07.9	196 19.2	21.5	343 52.8	46.7	156 49.8	03.9	175 30.6	59.7		° ′	h m
23	257 10.3	211 19.1	22.3	358 56.1	46.7	171 51.6	03.9	190 32.8	59.8	Venus	316 09.5	8 54
	h m									Marte	101 05.0	23 10
Pas. Mer.	5 58.1	v −0.1	d 0.7	v 3.3	d 0.0	v 1.8	d 0.0	v 2.1	d 0.0	Júpiter	275 10.6	11 37
										Saturno	293 37.6	10 23

T.U.	SOL A.H.G.	SOL Dec.	LUNA A.H.G.	v	LUNA Dec.	d	P.H.
d h	° ′	° ′	° ′	′	° ′	′	′
21 00	179 35.1	N23 26.3	186 48.3	5.1	N22 02.0	5.0	59.5
01	194 35.0	26.3	201 12.4	4.9	22 07.0	4.9	59.5
02	209 34.9	26.3	215 36.3	4.9	22 11.9	4.7	59.6
03	224 34.7	26.3	230 00.2	4.9	22 16.6	4.6	59.6
04	239 34.6	26.3	244 24.1	4.7	22 21.2	4.4	59.6
05	254 34.5	26.3	258 47.8	4.7	22 25.6	4.2	59.6
06	269 34.3	N23 26.3	273 11.5	4.6	N22 29.8	4.2	59.7
07	284 34.2	26.3	287 35.1	4.6	22 34.0	3.9	59.7
J 08	299 34.0	26.3	301 58.7	4.5	22 37.9	3.8	59.7
U 09	314 33.9	26.3	316 22.2	4.4	22 41.7	3.7	59.7
E 10	329 33.8	26.3	330 45.6	4.3	22 45.4	3.5	59.8
V 11	344 33.6	26.3	345 08.9	4.3	N22 48.9	3.4	59.8
E 12	359 33.5	N23 26.3					
13	14 33.4	26.3	Un eclipse total de Sol				
S 14	29 33.2	26.3	ocurre en esta fecha.				
15	44 33.1	26.3	Ver página 5.				
16	59 32.9	26.3					
17	74 32.8	26.3					
18	89 32.7	N23 26.3	85 50.8	3.9	N23 09.0	2.2	59.9
19	104 32.5	26.3	100 13.7	3.8	23 11.2	2.1	59.9
20	119 32.4	26.3	114 36.5	3.9	23 13.3	1.9	60.0
21	134 32.3	26.2	128 59.4	3.7	23 15.2	1.7	60.0
22	149 32.1	26.2	143 22.1	3.8	23 16.9	1.6	60.0
23	164 32.0	26.2	157 44.9	3.7	23 18.5	1.4	60.0
22 00	179 31.8	N23 26.2	172 07.6	3.7	N23 19.9	1.2	60.0
01	194 31.7	26.2	186 30.3	3.6	23 21.1	1.1	60.0
02	209 31.6	26.2	200 52.9	3.6	23 22.2	0.9	60.1
03	224 31.4	26.2	215 15.5	3.6	23 23.1	0.7	60.1
04	239 31.3	26.2	229 38.1	3.5	23 23.8	0.6	60.1
05	254 31.2	26.1	244 00.6	3.6	23 24.4	0.3	60.1
06	269 31.0	N23 26.1	258 23.2	3.5	N23 24.7	0.3	60.1
07	284 30.9	26.1	272 45.7	3.4	23 25.0	0.0	60.1
V 08	299 30.8	26.1	287 08.1	3.5	23 25.0	0.1	60.2
I 09	314 30.6	26.1	301 30.6	3.5	23 24.9	0.3	60.2
E 10	329 30.5	26.1	315 53.1	3.4	23 24.6	0.4	60.2
R 11	344 30.3	26.0	330 15.5	3.4	23 24.2	0.6	60.2
N 12	359 30.2	N23 26.0	344 37.9	3.5	N23 23.6	0.8	60.2
E 13	14 30.1	26.0	359 00.4	3.4	23 22.8	1.0	60.2
S 14	29 29.9	26.0	13 22.8	3.4	23 21.8	1.1	60.2
15	44 29.8	26.0	27 45.2	3.4	23 20.7	1.3	60.2
16	59 29.7	25.9	42 07.6	3.4	23 19.4	1.5	60.3
17	74 29.5	25.9	56 30.0	3.4	23 17.9	1.7	60.3
18	89 29.4	N23 25.9	70 52.4	3.5	N23 16.2	1.8	60.3
19	104 29.2	25.9	85 14.9	3.4	23 14.4	2.0	60.3
20	119 29.1	25.8	99 37.3	3.4	23 12.4	2.1	60.3
21	134 29.0	25.8	113 59.7	3.5	23 10.3	2.3	60.3
22	149 28.8	25.8	128 22.2	3.5	23 08.0	2.5	60.3
23	164 28.7	25.8	142 44.7	3.5	23 05.5	2.7	60.3
23 00	179 28.6	N23 25.7	157 07.2	3.5	N23 02.8	2.8	60.3
01	194 28.4	25.7	171 29.7	3.5	23 00.0	3.0	60.3
02	209 28.3	25.7	185 52.2	3.6	22 57.0	3.2	60.3
03	224 28.2	25.6	200 14.8	3.5	22 53.8	3.3	60.3
04	239 28.0	25.6	214 37.3	3.6	22 50.5	3.5	60.3
05	254 27.9	25.6	228 59.9	3.7	22 47.0	3.7	60.4
06	269 27.8	N23 25.5	243 22.6	3.6	N22 43.3	3.8	60.4
S 07	284 27.6	25.5	257 45.2	3.7	22 39.5	4.0	60.4
08	299 27.5	25.5	272 07.9	3.8	22 35.5	4.1	60.4
A 09	314 27.3	25.4	286 30.7	3.8	22 31.4	4.3	60.4
B 10	329 27.2	25.4	300 53.5	3.8	22 27.1	4.5	60.4
A 11	344 27.1	25.4	315 16.3	3.8	22 22.6	4.6	60.4
12	359 26.9	N23 25.3	329 39.1	3.9	N22 18.0	4.8	60.4
D 13	14 26.8	25.3	344 02.0	4.0	22 13.2	5.0	60.4
O 14	29 26.7	25.3	358 25.0	4.0	22 08.2	5.1	60.4
15	44 26.5	25.2	12 48.0	4.0	22 03.1	5.3	60.4
16	59 26.4	25.2	27 11.0	4.1	21 57.8	5.4	60.4
17	74 26.3	25.1	41 34.1	4.2	21 52.4	5.6	60.4
18	89 26.1	N23 25.1	55 57.3	4.2	N21 46.8	5.7	60.4
19	104 26.0	25.1	70 20.5	4.3	21 41.1	5.9	60.4
20	119 25.9	25.0	84 43.8	4.3	21 35.2	6.1	60.4
21	134 25.7	25.0	99 07.1	4.3	21 29.1	6.2	60.4
22	149 25.6	24.9	113 30.4	4.5	21 22.9	6.3	60.4
23	164 25.4	24.9	127 53.9	4.5	N21 16.6	6.5	60.4
	SD 15.8	d 0.0	SD 16.3		16.4		16.5

Lat.	Crepúsculo Náutico	Crepúsculo Civil	Orto Sol	Orto Luna 21	Orto Luna 22	Orto Luna 23	Orto Luna 24
°	h m	h m	h m	h m	h m	h m	h m
N 72	▭	▭	▭	▭	▭	▭	▭
N 70	▭	▭	▭	▭	▭	▭	▭
68	▭	▭	▭	▭	▭	▭	04 09
66	▭	▭	▭	01 16	01 38	02 58	04 56
64	////	////	01 31	01 53	02 32	03 45	05 26
62	////	////	02 09	02 20	03 04	04 15	05 48
60	////	00 49	02 36	02 41	03 28	04 38	06 07
N 58	////	01 41	02 56	02 58	03 48	04 57	06 22
56	////	02 11	03 13	03 12	04 04	05 12	06 34
54	00 45	02 33	03 28	03 25	04 17	05 26	06 46
52	01 32	02 51	03 40	03 36	04 30	05 37	06 56
50	02 00	03 06	03 51	03 46	04 40	05 47	07 04
45	02 46	03 36	04 13	04 07	05 03	06 09	07 23
N 40	03 17	03 59	04 31	04 23	05 21	06 26	07 38
35	03 40	04 17	04 47	04 38	05 36	06 41	07 51
30	03 59	04 32	05 00	04 50	05 49	06 54	08 02
20	04 28	04 57	05 22	05 11	06 11	07 15	08 21
N 10	04 51	05 18	05 41	05 30	06 31	07 34	08 38
0	05 10	05 36	05 58	05 47	06 49	07 52	08 53
S 10	05 27	05 53	06 16	06 05	07 08	08 09	09 08
20	05 43	06 10	06 34	06 24	07 27	08 28	09 25
30	05 59	06 29	06 56	06 45	07 50	08 50	09 44
35	06 08	06 40	07 08	06 58	08 03	09 02	09 55
40	06 18	06 52	07 22	07 13	08 18	09 17	10 07
45	06 28	07 05	07 39	07 30	08 37	09 34	10 22
S 50	06 40	07 21	08 00	07 52	09 00	09 56	10 40
52	06 45	07 29	08 10	08 03	09 10	10 06	10 48
54	06 51	07 37	08 21	08 14	09 23	10 17	10 58
56	06 57	07 46	08 34	08 28	09 37	10 30	11 08
58	07 04	07 56	08 48	08 43	09 54	10 45	11 20
S 60	07 11	08 08	09 06	09 02	10 13	11 03	11 34

Lat.	Ocaso Sol	Crepúsculo Civil	Crepúsculo Náutico	Ocaso Luna 21	Ocaso Luna 22	Ocaso Luna 23	Ocaso Luna 24
°	h m	h m	h m	h m	h m	h m	h m
N 72	▭	▭	▭	▭	▭	▭	▭
N 70	▭	▭	▭	▭	▭	▭	▭
68	▭	▭	▭	▭	▭	▭	01 16
66	▭	▭	▭	23 26	24 17	00 17	00 29
64	22 33	////	////	22 32	23 30	23 58	24 12
62	21 54	////	////	22 00	23 00	23 35	23 55
60	21 28	23 14	////	21 36	22 37	23 17	23 42
N 58	21 07	22 23	////	21 17	22 18	23 01	23 30
56	20 51	21 53	////	21 01	22 02	22 48	23 20
54	20 36	21 31	23 18	20 47	21 49	22 36	23 11
52	20 24	21 13	22 31	20 35	21 37	22 26	23 03
50	20 13	20 58	22 03	20 24	21 26	22 16	22 56
45	19 51	20 28	21 18	20 02	21 04	21 57	22 40
N 40	19 32	20 05	20 47	19 44	20 47	21 41	22 27
35	19 17	19 47	20 24	19 29	20 32	21 28	22 16
30	19 04	19 32	20 05	19 16	20 19	21 16	22 06
20	18 42	19 07	19 36	18 54	19 56	20 56	21 50
N 10	18 23	18 46	19 13	18 35	19 37	20 38	21 35
0	18 06	18 28	18 54	18 17	19 19	20 21	21 21
S 10	17 48	18 11	18 37	17 59	19 01	20 05	21 07
20	17 30	17 54	18 21	17 39	18 41	19 47	20 52
30	17 08	17 35	18 05	17 17	18 19	19 26	20 35
35	16 56	17 24	17 56	17 04	18 06	19 14	20 25
40	16 42	17 12	17 46	16 49	17 50	19 00	20 13
45	16 25	16 59	17 36	16 31	17 32	18 43	19 59
S 50	16 04	16 43	17 24	16 09	17 10	18 22	19 42
52	15 54	16 35	17 19	15 58	16 59	18 12	19 34
54	15 43	16 27	17 13	15 46	16 46	18 01	19 25
56	15 30	16 18	17 07	15 33	16 32	17 49	19 15
58	15 16	16 08	17 00	15 17	16 16	17 34	19 04
S 60	14 58	15 56	16 53	14 58	15 56	17 16	18 51

Día	SOL E.T. (−) 00h	SOL E.T. (−) 12h	SOL Pas. Mer.	LUNA Pas. Mer. Sup.	LUNA Pas. Mer. Inf.	LUNA Edad	LUNA Fase
d	m s	m s	h m	h m	h m	d	%
21	01 39	01 46	12 02	12 02	24 33	00	0
22	01 52	01 59	12 02	13 04	00 33	01	1
23	02 05	02 12	12 02	14 07	01 36	02	6

T.U.	ARIES	VENUS −4.2		MARTE −2.3		JUPITER −1.9		SATURNO +0.1	
	A.H.G.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
24 00	272 12.8	226 19.0	N14 23.0	13 59.4	S26 46.8	186 53.5	N23 03.9	205 34.9	N19 59.8
01	287 15.3	241 18.9	23.7	29 02.8	46.8	201 55.3	03.9	220 37.1	59.8
02	302 17.7	256 18.8	24.4	44 06.1	46.8	216 57.1	04.0	235 39.2	59.9
03	317 20.2	271 18.6 . .	25.1	59 09.4 . .	46.9	231 59.0 . .	04.0	250 41.4	19 59.9
04	332 22.6	286 18.5	25.8	74 12.7	46.9	247 00.8	04.0	265 43.5	20 00.0
05	347 25.1	301 18.4	26.6	89 16.0	47.0	262 02.7	04.0	280 45.6	00.0
06	2 27.6	316 18.3	N14 27.3	104 19.3	S26 47.0	277 04.5	N23 04.1	295 47.8	N20 00.1
07	17 30.0	331 18.1	28.0	119 22.7	47.0	292 06.3	04.1	310 49.9	00.1
08	32 32.5	346 18.0	28.7	134 26.0	47.1	307 08.2	04.1	325 52.1	00.2
D 09	47 35.0	1 17.9 . .	29.4	149 29.3 . .	47.1	322 10.0 . .	04.1	340 54.2 . .	00.2
O 10	62 37.4	16 17.8	30.1	164 32.6	47.2	337 11.9	04.1	355 56.4	00.3
M 11	77 39.9	31 17.6	30.9	179 35.9	47.2	352 13.7	04.2	10 58.5	00.3
I 12	92 42.4	46 17.5	N14 31.6	194 39.2	S26 47.2	7 15.6	N23 04.2	26 00.7	N20 00.4
N 13	107 44.8	61 17.4	32.3	209 42.5	47.3	22 17.4	04.2	41 02.8	00.4
G 14	122 47.3	76 17.2	33.0	224 45.8	47.3	37 19.2	04.2	56 04.9	00.5
O 15	137 49.7	91 17.1 . .	33.7	239 49.1 . .	47.3	52 21.1 . .	04.2	71 07.1 . .	00.5
16	152 52.2	106 17.0	34.4	254 52.4	47.4	67 22.9	04.3	86 09.2	00.6
17	167 54.7	121 16.9	35.1	269 55.7	47.4	82 24.8	04.3	101 11.4	00.6
18	182 57.1	136 16.7	N14 35.8	284 59.0	S26 47.4	97 26.6	N23 04.3	116 13.5	N20 00.7
19	197 59.6	151 16.6	36.6	300 02.4	47.5	112 28.4	04.3	131 15.7	00.7
20	213 02.1	166 16.5	37.3	315 05.7	47.5	127 30.3	04.4	146 17.8	00.8
21	228 04.5	181 16.3 . .	38.0	330 09.0 . .	47.6	142 32.1 . .	04.4	161 20.0 . .	00.8
22	243 07.0	196 16.2	38.7	345 12.3	47.6	157 34.0	04.4	176 22.1	00.8
23	258 09.5	211 16.1	39.4	0 15.6	47.6	172 35.8	04.4	191 24.2	00.9
25 00	273 11.9	226 15.9	N14 40.1	15 18.9	S26 47.7	187 37.6	N23 04.4	206 26.4	N20 00.9
01	288 14.4	241 15.8	40.8	30 22.2	47.7	202 39.5	04.5	221 28.5	01.0
02	303 16.9	256 15.6	41.5	45 25.5	47.7	217 41.3	04.5	236 30.7	01.0
03	318 19.3	271 15.5 . .	42.3	60 28.8 . .	47.8	232 43.2 . .	04.5	251 32.8 . .	01.1
04	333 21.8	286 15.4	43.0	75 32.1	47.8	247 45.0	04.5	266 35.0	01.1
05	348 24.2	301 15.2	43.7	90 35.3	47.8	262 46.8	04.5	281 37.1	01.2
06	3 26.7	316 15.1	N14 44.4	105 38.6	S26 47.9	277 48.7	N23 04.6	296 39.3	N20 01.2
07	18 29.2	331 15.0	45.1	120 41.9	47.9	292 50.5	04.6	311 41.4	01.3
08	33 31.6	346 14.8	45.8	135 45.2	47.9	307 52.4	04.6	326 43.6	01.3
L 09	48 34.1	1 14.7 . .	46.5	150 48.5 . .	48.0	322 54.2 . .	04.6	341 45.7 . .	01.4
U 10	63 36.6	16 14.5	47.2	165 51.8	48.0	337 56.1	04.7	356 47.8	01.4
11	78 39.0	31 14.4	47.9	180 55.1	48.0	352 57.9	04.7	11 50.0	01.5
N 12	93 41.5	46 14.2	N14 48.6	195 58.4	S26 48.1	7 59.7	N23 04.7	26 52.1	N20 01.5
E 13	108 44.0	61 14.1	49.3	211 01.7	48.1	23 01.6	04.7	41 54.3	01.6
14	123 46.4	76 14.0	50.0	226 05.0	48.1	38 03.4	04.7	56 56.4	01.6
S 15	138 48.9	91 13.8 . .	50.8	241 08.3 . .	48.2	53 05.3 . .	04.8	71 58.6 . .	01.6
16	153 51.4	106 13.7	51.5	256 11.5	48.2	68 07.1	04.8	87 00.7	01.7
17	168 53.8	121 13.5	52.2	271 14.8	48.2	83 08.9	04.8	102 02.9	01.7
18	183 56.3	136 13.4	N14 52.9	286 18.1	S26 48.2	98 10.8	N23 04.8	117 05.0	N20 01.8
19	198 58.7	151 13.2	53.6	301 21.4	48.3	113 12.6	04.8	132 07.2	01.8
20	214 01.2	166 13.1	54.3	316 24.7	48.3	128 14.5	04.9	147 09.3	01.9
21	229 03.7	181 12.9 . .	55.0	331 28.0 . .	48.3	143 16.3 . .	04.9	162 11.4 . .	01.9
22	244 06.1	196 12.8	55.7	346 31.3	48.4	158 18.2	04.9	177 13.6	02.0
23	259 08.6	211 12.6	56.4	1 34.5	48.4	173 20.0	04.9	192 15.7	02.0
26 00	274 11.1	226 12.5	N14 57.1	16 37.8	S26 48.4	188 21.8	N23 04.9	207 17.9	N20 02.1
01	289 13.5	241 12.3	57.8	31 41.1	48.5	203 23.7	05.0	222 20.0	02.1
02	304 16.0	256 12.2	58.5	46 44.4	48.5	218 25.5	05.0	237 22.2	02.2
03	319 18.5	271 12.0 . .	59.2	61 47.6 . .	48.5	233 27.4 . .	05.0	252 24.3 . .	02.2
04	334 20.9	286 11.9	14 59.9	76 50.9	48.6	248 29.2	05.0	267 26.5	02.3
05	349 23.4	301 11.7	15 00.6	91 54.2	48.6	263 31.0	05.0	282 28.6	02.3
06	4 25.8	316 11.5	N15 01.3	106 57.5	S26 48.6	278 32.9	N23 05.1	297 30.8	N20 02.3
07	19 28.3	331 11.4	02.0	122 00.7	48.6	293 34.7	05.1	312 32.9	02.4
M 08	34 30.8	346 11.2	02.7	137 04.0	48.7	308 36.6	05.1	327 35.1	02.4
A 09	49 33.2	1 11.1 . .	03.4	152 07.3 . .	48.7	323 38.4 . .	05.1	342 37.2 . .	02.5
R 10	64 35.7	16 10.9	04.1	167 10.6	48.7	338 40.3	05.1	357 39.4	02.5
11	79 38.2	31 10.8	04.8	182 13.8	48.8	353 42.1	05.2	12 41.5	02.6
T 12	94 40.6	46 10.6	N15 05.5	197 17.1	S26 48.8	8 43.9	N23 05.2	27 43.6	N20 02.6
13	109 43.1	61 10.4	06.3	212 20.4	48.8	23 45.8	05.2	42 45.8	02.7
E 14	124 45.6	76 10.3	07.0	227 23.6	48.8	38 47.6	05.2	57 47.9	02.7
S 15	139 48.0	91 10.1 . .	07.7	242 26.9 . .	48.9	53 49.5 . .	05.2	72 50.1 . .	02.8
16	154 50.5	106 10.0	08.4	257 30.2	48.9	68 51.3	05.3	87 52.2	02.8
17	169 53.0	121 09.8	09.1	272 33.4	48.9	83 53.1	05.3	102 54.4	02.9
18	184 55.4	136 09.6	N15 09.8	287 36.7	S26 48.9	98 55.0	N23 05.3	117 56.5	N20 02.9
19	199 57.9	151 09.5	10.5	302 40.0	49.0	113 56.8	05.3	132 58.7	03.0
20	215 00.3	166 09.3	11.2	317 43.2	49.0	128 58.7	05.3	148 00.8	03.0
21	230 02.8	181 09.1 . .	11.9	332 46.5 . .	49.0	144 00.5 . .	05.4	163 03.0 . .	03.0
22	245 05.3	196 09.0	12.5	347 49.7	49.1	159 02.4	05.4	178 05.1	03.1
23	260 07.7	211 08.8	13.2	2 53.0	49.1	174 04.2	05.4	193 07.3	03.1
	h m								
Pas. Mer.	5 46.3	*v* −0.1	*d* 0.7	*v* 3.3	*d* 0.0	*v* 1.8	*d* 0.0	*v* 2.1	*d* 0.0

ESTRELLAS		
Nombre	A.H.S.	Dec.
	° ′	° ′
Acamar	315 25.7	S40 17.9
Achernar	335 33.9	S57 13.6
Acrux	173 19.9	S63 06.6
Adhara	255 20.3	S28 58.5
Aldebaran	291 00.5	N16 30.6
Alioth	166 28.7	N55 57.5
Alkaid	153 06.0	N49 18.7
Al Na'ir	27 55.2	S46 57.1
Alnilam	275 56.3	S 1 12.1
Alphard	218 05.6	S 8 39.9
Alphecca	126 18.7	N26 42.8
Alpheratz	357 53.3	N29 05.7
Altair	62 17.1	N 8 52.3
Ankaa	353 24.9	S42 17.8
Antares	112 37.5	S26 26.1
Arcturus	146 04.1	N19 10.7
Atria	107 47.3	S69 01.9
Avior	234 22.5	S59 31.0
Bellatrix	278 42.4	N 6 21.0
Betelgeuse	271 11.8	N 7 24.4
Canopus	264 00.9	S52 41.8
Capella	280 48.8	N45 59.9
Deneb	49 37.5	N45 17.0
Denebola	182 43.3	N14 34.0
Diphda	349 05.3	S17 58.7
Dubhe	194 03.3	N61 45.0
Elnath	278 24.9	N28 36.4
Eltanin	90 50.0	N51 29.4
Enif	33 56.2	N 9 52.8
Fomalhaut	15 34.2	S29 36.8
Gacrux	172 11.5	S57 07.5
Gienah	176 02.0	S17 33.0
Hadar	149 01.1	S60 23.0
Hamal	328 11.6	N23 27.9
Kaus Aust.	83 55.9	S34 23.0
Kochab	137 18.7	N74 09.3
Markab	13 47.6	N15 12.6
Menkar	314 25.1	N 4 05.6
Menkent	148 18.5	S36 22.7
Miaplacidus	221 42.5	S69 43.6
Mirfak	308 54.3	N49 51.7
Nunki	76 09.6	S26 17.7
Peacock	53 33.4	S56 43.7
Pollux	243 39.6	N28 01.4
Procyon	245 09.9	N 5 13.3
Rasalhague	96 14.8	N12 33.6
Regulus	207 53.7	N11 57.7
Rigel	281 21.4	S 8 12.0
Rigil Kent.	140 04.4	S60 50.6
Sabik	102 23.0	S15 43.6
Schedar	349 51.4	N56 32.3
Shaula	96 34.3	S37 06.3
Sirius	258 42.4	S16 43.1
Spica	158 41.1	S11 10.1
Suhail	222 59.7	S43 26.4
Vega	80 44.9	N38 47.1
Zuben'ubi	137 15.6	S16 02.8

	A.H.S.	Pas. Mer.
	° ′	h m
Venus	313 04.0	8 55
Marte	102 06.9	22 54
Júpiter	274 25.7	11 28
Saturno	293 14.5	10 13

T.U.	SOL				LUNA					
	A.H.G.		Dec.		A.H.G.	v	Dec.		d	P.H.
d h	°	′	°	′	°	′	′	°	′	′	′	′
24 00	179	25.3	N23	24.8	142	17.4	4.5	N21	10.1	6.6	60.4
01	194	25.2		24.8	156	40.9	4.7	21	03.5	6.8	60.4
02	209	25.0		24.7	171	04.6	4.7	20	56.7	6.9	60.4
03	224	24.9	. .	24.7	185	28.3	4.7	20	49.8	7.1	60.4
04	239	24.8		24.6	199	52.0	4.9	20	42.7	7.2	60.4
05	254	24.6		24.6	214	15.9	4.9	20	35.5	7.4	60.4
06	269	24.5	N23	24.5	228	39.8	4.9	N20	28.1	7.5	60.4
07	284	24.4		24.5	243	03.7	5.1	20	20.6	7.6	60.3
D 08	299	24.2		24.4	257	27.8	5.1	20	13.0	7.8	60.3
O 09	314	24.1	. .	24.4	271	51.9	5.2	20	05.2	7.9	60.3
M 10	329	24.0		24.3	286	16.1	5.3	19	57.3	8.0	60.3
I 11	344	23.8		24.3	300	40.4	5.3	19	49.3	8.2	60.3
N 12	359	23.7	N23	24.2	315	04.7	5.4	N19	41.1	8.3	60.3
G 13	14	23.6		24.2	329	29.1	5.5	19	32.8	8.5	60.3
O 14	29	23.4		24.1	343	53.6	5.6	19	24.3	8.5	60.3
15	44	23.3	. .	24.1	358	18.2	5.7	19	15.8	8.7	60.3
16	59	23.2		24.0	12	42.9	5.7	19	07.1	8.8	60.3
17	74	23.0		23.9	27	07.6	5.8	18	58.3	9.0	60.3
18	89	22.9	N23	23.9	41	32.4	5.9	N18	49.3	9.0	60.3
19	104	22.7		23.8	55	57.3	6.0	18	40.3	9.2	60.3
20	119	22.6		23.8	70	22.3	6.0	18	31.1	9.3	60.2
21	134	22.5	. .	23.7	84	47.3	6.2	18	21.8	9.4	60.2
22	149	22.3		23.6	99	12.5	6.2	18	12.4	9.6	60.2
23	164	22.2		23.6	113	37.7	6.3	18	02.8	9.6	60.2
25 00	179	22.1	N23	23.5	128	03.0	6.4	N17	53.2	9.8	60.2
01	194	21.9		23.5	142	28.4	6.5	17	43.4	9.9	60.2
02	209	21.8		23.4	156	53.9	6.6	17	33.5	9.9	60.2
03	224	21.7	. .	23.3	171	19.5	6.6	17	23.6	10.1	60.2
04	239	21.5		23.3	185	45.1	6.8	17	13.5	10.2	60.2
05	254	21.4		23.2	200	10.9	6.8	17	03.3	10.3	60.1
06	269	21.3	N23	23.1	214	36.7	6.9	N16	53.0	10.4	60.1
07	284	21.1		23.1	229	02.6	7.0	16	42.6	10.5	60.1
08	299	21.0		23.0	243	28.6	7.1	16	32.1	10.6	60.1
L 09	314	20.9	. .	22.9	257	54.7	7.1	16	21.5	10.7	60.1
U 10	329	20.7		22.8	272	20.8	7.3	16	10.8	10.8	60.1
N 11	344	20.6		22.8	286	47.1	7.3	16	00.0	10.9	60.1
E 12	359	20.5	N23	22.7	301	13.4	7.4	N15	49.1	11.0	60.0
S 13	14	20.3		22.6	315	39.8	7.5	15	38.1	11.1	60.0
14	29	20.2		22.6	330	06.3	7.6	15	27.0	11.2	60.0
15	44	20.1	. .	22.5	344	32.9	7.7	15	15.8	11.2	60.0
16	59	19.9		22.4	358	59.6	7.8	15	04.6	11.4	60.0
17	74	19.8		22.3	13	26.4	7.8	14	53.2	11.4	60.0
18	89	19.7	N23	22.3	27	53.2	8.0	N14	41.8	11.5	60.0
19	104	19.5		22.2	42	20.2	8.0	14	30.3	11.6	59.9
20	119	19.4		22.1	56	47.2	8.1	14	18.7	11.7	59.9
21	134	19.3	. .	22.0	71	14.3	8.1	14	07.0	11.7	59.9
22	149	19.1		22.0	85	41.4	8.3	13	55.3	11.9	59.9
23	164	19.0		21.9	100	08.7	8.3	13	43.4	11.9	59.9
26 00	179	18.9	N23	21.8	114	36.0	8.5	N13	31.5	12.0	59.8
01	194	18.7		21.7	129	03.5	8.5	13	19.5	12.0	59.8
02	209	18.6		21.6	143	31.0	8.6	13	07.5	12.1	59.8
03	224	18.5	. .	21.5	157	58.6	8.6	12	55.4	12.2	59.8
04	239	18.4		21.5	172	26.2	8.8	12	43.2	12.3	59.8
05	254	18.2		21.4	186	54.0	8.8	12	30.9	12.3	59.8
06	269	18.1	N23	21.3	201	21.8	8.9	N12	18.6	12.4	59.7
07	284	18.0		21.2	215	49.7	9.0	12	06.2	12.4	59.7
M 08	299	17.8		21.1	230	17.7	9.1	11	53.8	12.5	59.7
A 09	314	17.7	. .	21.0	244	45.8	9.1	11	41.3	12.6	59.7
R 10	329	17.6		21.0	259	13.9	9.2	11	28.7	12.6	59.7
11	344	17.4		20.9	273	42.1	9.3	11	16.1	12.7	59.6
T 12	359	17.3	N23	20.8	288	10.4	9.4	N11	03.4	12.7	59.6
13	14	17.2		20.7	302	38.8	9.4	10	50.7	12.8	59.6
E 14	29	17.0		20.6	317	07.2	9.5	10	37.9	12.9	59.6
S 15	44	16.9	. .	20.5	331	35.7	9.6	10	25.0	12.9	59.6
16	59	16.8		20.4	346	04.3	9.6	10	12.1	12.9	59.5
17	74	16.6		20.3	0	32.9	9.8	9	59.2	13.0	59.5
18	89	16.5	N23	20.2	15	01.7	9.8	N 9	46.2	13.0	59.5
19	104	16.4		20.1	29	30.5	9.8	9	33.2	13.1	59.5
20	119	16.2		20.0	43	59.3	10.0	9	20.1	13.1	59.4
21	134	16.1	. .	19.9	58	28.3	10.0	9	07.0	13.2	59.4
22	149	16.0		19.9	72	57.3	10.0	8	53.8	13.2	59.4
23	164	15.9		19.8	87	26.3	10.1	N 8	40.6	13.2	59.4
	SD	15.8	d	0.1	SD	16.4		16.4			16.2

Lat.	Crepúsculo Náutico	Crepúsculo Civil	Orto Sol	Orto Luna 24	Orto Luna 25	Orto Luna 26	Orto Luna 27
°	h m	h m	h m	h m	h m	h m	h m
N 72	▭	▭	▭	▭	05 03	08 00	10 18
N 70	▭	▭	▭	▭	05 59	08 21	10 27
68	▭	▭	▭	04 09	06 32	08 38	10 34
66	▭	▭	▭	04 56	06 56	08 51	10 40
64	////	////	01 33	05 26	07 15	09 02	10 45
62	////	////	02 11	05 48	07 30	09 12	10 50
60	////	00 52	02 37	06 07	07 43	09 20	10 54
N 58	////	01 42	02 58	06 22	07 54	09 26	10 57
56	////	02 12	03 14	06 34	08 03	09 33	11 00
54	00 48	02 34	03 29	06 46	08 12	09 38	11 03
52	01 34	02 52	03 41	06 56	08 19	09 43	11 05
50	02 02	03 07	03 52	07 04	08 26	09 47	11 07
45	02 47	03 37	04 14	07 23	08 40	09 57	11 12
N 40	03 18	03 59	04 32	07 38	08 52	10 05	11 16
35	03 41	04 18	04 47	07 51	09 02	10 12	11 19
30	04 00	04 33	05 00	08 02	09 11	10 18	11 22
20	04 29	04 58	05 22	08 21	09 26	10 28	11 28
N 10	04 51	05 18	05 41	08 38	09 39	10 37	11 32
0	05 10	05 36	05 59	08 53	09 51	10 45	11 36
S 10	05 27	05 54	06 16	09 08	10 03	10 54	11 41
20	05 43	06 11	06 35	09 25	10 16	11 03	11 45
30	06 00	06 30	06 56	09 44	10 31	11 13	11 51
35	06 09	06 40	07 08	09 55	10 39	11 19	11 53
40	06 18	06 52	07 23	10 07	10 49	11 25	11 57
45	06 28	07 06	07 39	10 22	11 01	11 33	12 01
S 50	06 40	07 22	08 00	10 40	11 14	11 42	12 05
52	06 45	07 29	08 10	10 48	11 21	11 46	12 07
54	06 51	07 37	08 21	10 58	11 28	11 51	12 10
56	06 57	07 46	08 34	11 08	11 35	11 56	12 12
58	07 04	07 57	08 48	11 20	11 44	12 01	12 15
S 60	07 11	08 08	09 06	11 34	11 54	12 08	12 18

Lat.	Ocaso Sol	Crepúsculo Civil	Crepúsculo Náutico	Ocaso Luna 24	Ocaso Luna 25	Ocaso Luna 26	Ocaso Luna 27
°	h m	h m	h m	h m	h m	h m	h m
N 72	▭	▭	▭	▭	02 28	01 27	00 58
N 70	▭	▭	▭	▭	01 31	01 04	00 46
68	▭	▭	▭	01 16	00 56	00 45	00 37
66	▭	▭	▭	00 29	00 31	00 30	00 29
64	22 32	////	////	24 12	00 12	00 18	00 22
62	21 54	////	////	23 55	24 08	00 08	00 16
60	21 28	23 12	////	23 42	23 59	24 11	00 11
N 58	21 07	22 23	////	23 30	23 51	24 06	00 06
56	20 51	21 53	////	23 20	23 44	24 02	00 02
54	20 36	21 31	23 17	23 11	23 37	23 58	24 16
52	20 24	21 13	22 31	23 03	23 32	23 55	24 15
50	20 13	20 58	22 03	22 56	23 27	23 52	24 14
45	19 51	20 28	21 18	22 40	23 15	23 45	24 12
N 40	19 33	20 06	20 47	22 27	23 06	23 40	24 10
35	19 18	19 48	20 24	22 16	22 58	23 35	24 09
30	19 05	19 32	20 06	22 06	22 51	23 31	24 07
20	18 43	19 07	19 37	21 50	22 38	23 23	24 04
N 10	18 24	18 47	19 14	21 35	22 28	23 16	24 02
0	18 06	18 29	18 55	21 21	22 17	23 10	24 00
S 10	17 49	18 12	18 38	21 07	22 07	23 04	23 58
20	17 30	17 54	18 22	20 52	21 56	22 57	23 55
30	17 09	17 36	18 05	20 35	21 43	22 49	23 53
35	16 57	17 25	17 57	20 25	21 35	22 44	23 51
40	16 43	17 13	17 47	20 13	21 27	22 39	23 49
45	16 26	17 00	17 37	19 59	21 17	22 33	23 47
S 50	16 05	16 44	17 25	19 42	21 04	22 26	23 44
52	15 55	16 36	17 20	19 34	20 59	22 22	23 43
54	15 44	16 28	17 14	19 25	20 52	22 18	23 42
56	15 32	16 19	17 08	19 15	20 45	22 14	23 40
58	15 17	16 09	17 01	19 04	20 37	22 09	23 39
S 60	14 59	15 57	16 54	18 51	20 28	22 04	23 37

Día	SOL E.T. (−) 00h	SOL E.T. (−) 12h	SOL Pas. Mer.	LUNA Pas. Mer. Sup.	LUNA Pas. Mer. Inf.	LUNA Edad	LUNA Fase
d	m s	m s	h m	h m	h m	d	%
24	02 18	02 25	12 02	15 07	02 37	03	12
25	02 31	02 38	12 03	16 04	03 36	04	21
26	02 44	02 51	12 03	16 58	04 31	05	32

T.U.	ARIES	VENUS −4.2		MARTE −2.2		JUPITER −1.9		SATURNO +0.1	
	A.H.G.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
27 00	275 10.2	226 08.6	N15 13.9	17 56.3	S26 49.1	189 06.0	N23 05.4	208 09.4	N20 03.2
01	290 12.7	241 08.5	14.6	32 59.5	49.1	204 07.9	05.4	223 11.6	03.2
02	305 15.1	256 08.3	15.3	48 02.8	49.2	219 09.7	05.5	238 13.7	03.3
03	320 17.6	271 08.1	16.0	63 06.0	49.2	234 11.6	05.5	253 15.9	03.3
04	335 20.1	286 08.0	16.7	78 09.3	49.2	249 13.4	05.5	268 18.0	03.4
05	350 22.5	301 07.8	17.4	93 12.5	49.2	264 15.3	05.5	283 20.2	03.4
06	5 25.0	316 07.6	N15 18.1	108 15.8	S26 49.3	279 17.1	N23 05.5	298 22.3	N20 03.5
M 07	20 27.5	331 07.5	18.8	123 19.0	49.3	294 18.9	05.6	313 24.4	03.5
I 08	35 29.9	346 07.3	19.5	138 22.3	49.3	309 20.8	05.6	328 26.6	03.6
E 09	50 32.4	1 07.1	20.2	153 25.5	49.3	324 22.6	05.6	343 28.7	03.6
R 10	65 34.8	16 06.9	20.9	168 28.8	49.4	339 24.5	05.6	358 30.9	03.6
C 11	80 37.3	31 06.8	21.6	183 32.0	49.4	354 26.3	05.6	13 33.0	03.7
O 12	95 39.8	46 06.6	N15 22.3	198 35.3	S26 49.4	9 28.2	N23 05.6	28 35.2	N20 03.7
L 13	110 42.2	61 06.4	23.0	213 38.5	49.4	24 30.0	05.7	43 37.3	03.8
E 14	125 44.7	76 06.2	23.7	228 41.8	49.5	39 31.8	05.7	58 39.5	03.8
S 15	140 47.2	91 06.1	24.4	243 45.0	49.5	54 33.7	05.7	73 41.6	03.9
16	155 49.6	106 05.9	25.1	258 48.3	49.5	69 35.5	05.7	88 43.8	03.9
17	170 52.1	121 05.7	25.8	273 51.5	49.5	84 37.4	05.7	103 45.9	04.0
18	185 54.6	136 05.5	N15 26.5	288 54.7	S26 49.5	99 39.2	N23 05.8	118 48.1	N20 04.0
19	200 57.0	151 05.3	27.1	303 58.0	49.6	114 41.1	05.8	133 50.2	04.1
20	215 59.5	166 05.2	27.8	319 01.2	49.6	129 42.9	05.8	148 52.4	04.1
21	231 01.9	181 05.0	28.5	334 04.5	49.6	144 44.7	05.8	163 54.5	04.1
22	246 04.4	196 04.8	29.2	349 07.7	49.6	159 46.6	05.8	178 56.7	04.2
23	261 06.9	211 04.6	29.9	4 10.9	49.7	174 48.4	05.8	193 58.8	04.2
28 00	276 09.3	226 04.4	N15 30.6	19 14.2	S26 49.7	189 50.3	N23 05.9	209 01.0	N20 04.3
01	291 11.8	241 04.3	31.3	34 17.4	49.7	204 52.1	05.9	224 03.1	04.3
02	306 14.3	256 04.1	32.0	49 20.6	49.7	219 54.0	05.9	239 05.3	04.4
03	321 16.7	271 03.9	32.7	64 23.9	49.7	234 55.8	05.9	254 07.4	04.4
04	336 19.2	286 03.7	33.4	79 27.1	49.8	249 57.6	05.9	269 09.6	04.5
05	351 21.7	301 03.5	34.1	94 30.3	49.8	264 59.5	06.0	284 11.7	04.5
06	6 24.1	316 03.3	N15 34.7	109 33.5	S26 49.8	280 01.3	N23 06.0	299 13.9	N20 04.6
J 07	21 26.6	331 03.1	35.4	124 36.8	49.8	295 03.2	06.0	314 16.0	04.6
U 08	36 29.1	346 02.9	36.1	139 40.0	49.9	310 05.0	06.0	329 18.2	04.6
E 09	51 31.5	1 02.8	36.8	154 43.2	49.9	325 06.9	06.0	344 20.3	04.7
V 10	66 34.0	16 02.6	37.5	169 46.4	49.9	340 08.7	06.0	359 22.5	04.7
E 11	81 36.4	31 02.4	38.2	184 49.7	49.9	355 10.5	06.1	14 24.6	04.8
S 12	96 38.9	46 02.2	N15 38.9	199 52.9	S26 49.9	10 12.4	N23 06.1	29 26.8	N20 04.8
13	111 41.4	61 02.0	39.6	214 56.1	50.0	25 14.2	06.1	44 28.9	04.9
14	126 43.8	76 01.8	40.2	229 59.3	50.0	40 16.1	06.1	59 31.1	04.9
15	141 46.3	91 01.6	40.9	245 02.5	50.0	55 17.9	06.1	74 33.2	05.0
16	156 48.8	106 01.4	41.6	260 05.8	50.0	70 19.8	06.2	89 35.4	05.0
17	171 51.2	121 01.2	42.3	275 09.0	50.0	85 21.6	06.2	104 37.5	05.1
18	186 53.7	136 01.0	N15 43.0	290 12.2	S26 50.1	100 23.5	N23 06.2	119 39.7	N20 05.1
19	201 56.2	151 00.8	43.7	305 15.4	50.1	115 25.3	06.2	134 41.8	05.1
20	216 58.6	166 00.6	44.3	320 18.6	50.1	130 27.1	06.2	149 44.0	05.2
21	232 01.1	181 00.4	45.0	335 21.8	50.1	145 29.0	06.2	164 46.1	05.2
22	247 03.6	196 00.2	45.7	350 25.0	50.1	160 30.8	06.3	179 48.3	05.3
23	262 06.0	211 00.1	46.4	5 28.3	50.1	175 32.7	06.3	194 50.4	05.3
29 00	277 08.5	225 59.9	N15 47.1	20 31.5	S26 50.2	190 34.5	N23 06.3	209 52.6	N20 05.4
01	292 10.9	240 59.7	47.8	35 34.7	50.2	205 36.4	06.3	224 54.7	05.4
02	307 13.4	255 59.5	48.4	50 37.9	50.2	220 38.2	06.3	239 56.9	05.5
03	322 15.9	270 59.3	49.1	65 41.1	50.2	235 40.0	06.3	254 59.0	05.5
04	337 18.3	285 59.1	49.8	80 44.3	50.2	250 41.9	06.4	270 01.2	05.5
05	352 20.8	300 58.9	50.5	95 47.5	50.3	265 43.7	06.4	285 03.3	05.6
06	7 23.3	315 58.7	N15 51.2	110 50.7	S26 50.3	280 45.6	N23 06.4	300 05.5	N20 05.6
07	22 25.7	330 58.4	51.8	125 53.9	50.3	295 47.4	06.4	315 07.6	05.7
V 08	37 28.2	345 58.2	52.5	140 57.1	50.3	310 49.3	06.4	330 09.8	05.7
I 09	52 30.7	0 58.0	53.2	156 00.3	50.3	325 51.1	06.4	345 11.9	05.8
E 10	67 33.1	15 57.8	53.9	171 03.5	50.3	340 53.0	06.5	0 14.1	05.8
R 11	82 35.6	30 57.6	54.6	186 06.7	50.4	355 54.8	06.5	15 16.2	05.9
N 12	97 38.0	45 57.4	N15 55.2	201 09.9	S26 50.4	10 56.6	N23 06.5	30 18.4	N20 05.9
E 13	112 40.5	60 57.2	55.9	216 13.1	50.4	25 58.5	06.5	45 20.5	06.0
S 14	127 43.0	75 57.0	56.6	231 16.3	50.4	41 00.3	06.5	60 22.7	06.0
15	142 45.4	90 56.8	57.3	246 19.5	50.4	56 02.2	06.5	75 24.8	06.0
16	157 47.9	105 56.6	57.9	261 22.7	50.4	71 04.0	06.6	90 27.0	06.1
17	172 50.4	120 56.4	58.6	276 25.8	50.5	86 05.9	06.6	105 29.1	06.1
18	187 52.8	135 56.2	N15 59.3	291 29.0	S26 50.5	101 07.7	N23 06.6	120 31.3	N20 06.2
19	202 55.3	150 56.0	16 00.0	306 32.2	50.5	116 09.6	06.6	135 33.4	06.2
20	217 57.8	165 55.8	00.6	321 35.4	50.5	131 11.4	06.6	150 35.6	06.3
21	233 00.2	180 55.5	01.3	336 38.6	50.5	146 13.2	06.6	165 37.7	06.3
22	248 02.7	195 55.3	02.0	351 41.8	50.5	161 15.1	06.7	180 39.9	06.4
23	263 05.2	210 55.1	02.7	6 45.0	50.5	176 16.9	06.7	195 42.0	06.4
Pas. Mer.	h m 5 34.5	v −0.2	d 0.7	v 3.2	d 0.0	v 1.8	d 0.0	v 2.1	d 0.0

ESTRELLAS

Nombre	A.H.S. ° ′	Dec. ° ′
Acamar	315 25.7	S40 17.8
Acherna	335 33.9	S57 13.6
Acrux	173 20.0	S63 06.6
Adhara	255 20.3	S28 58.5
Aldebaran	291 00.5	N16 30.6
Alioth	166 28.8	N55 57.5
Alkaid	153 06.1	N49 18.7
Al Na'ir	27 55.2	S46 57.1
Alnilam	275 56.2	S 1 12.1
Alphard	218 05.6	S 8 39.9
Alphecca	126 18.7	N26 42.8
Alpheratz	357 53.2	N29 05.7
Altair	62 17.1	N 8 52.3
Ankaa	353 24.9	S42 17.8
Antares	112 37.5	S26 26.1
Arcturus	146 04.1	N19 10.7
Atria	107 47.3	S69 01.9
Avior	234 22.5	S59 31.0
Bellatrix	278 42.4	N 6 21.0
Betelgeuse	271 11.8	N 7 24.4
Canopus	264 00.9	S52 41.8
Capella	280 48.8	N45 59.9
Deneb	49 37.5	N45 17.0
Denebola	182 43.3	N14 34.0
Diphda	349 05.3	S17 58.7
Dubhe	194 03.3	N61 45.0
Elnath	278 24.9	N28 36.4
Eltanin	90 50.0	N51 29.4
Enif	33 56.1	N 9 52.8
Fomalhaut	15 34.1	S29 36.8
Gacrux	172 11.5	S57 07.5
Gienah	176 02.0	S17 33.0
Hadar	149 01.1	S60 23.0
Hamal	328 11.6	N23 28.0
Kaus Aust.	83 55.9	S34 23.0
Kochab	137 18.8	N74 09.3
Markab	13 47.6	N15 12.6
Menkar	314 25.1	N 4 05.6
Menkent	148 18.5	S36 22.7
Miaplacidus	221 42.5	S69 43.5
Mirfak	308 54.3	N49 51.7
Nunki	76 09.6	S26 17.7
Peacock	53 33.4	S56 43.7
Pollux	243 39.6	N28 01.4
Procyon	245 09.9	N 5 13.3
Rasalhague	96 14.8	N12 33.6
Regulus	207 53.7	N11 57.8
Rigel	281 21.4	S 8 12.0
Rigil Kent.	140 04.4	S60 50.6
Sabik	102 23.0	S15 43.6
Schedar	349 51.4	N56 32.3
Shaula	96 34.3	S37 06.3
Sirius	258 42.4	S16 43.1
Spica	158 41.1	S11 10.1
Suhail	222 59.8	S43 26.4
Vega	80 44.9	N38 47.1
Zuben'ubi	137 15.6	S16 02.8

	A.H.S. ° ′	Pas. Mer. h m
Venus	309 55.1	8 56
Marte	103 04.8	22 38
Júpiter	273 40.9	11 19
Saturno	292 51.6	10 02

T.U.	SOL				LUNA						
	A.H.G.		Dec.		A.H.G.	v	Dec.	d	P.H.		
d h	°	′	°	′	°	′	′	°	′	′	′
27 00	179	15.7	N23	19.7	101	55.4	10.2	N 8	27.4	13.3	59.4
01	194	15.6		19.6	116	24.6	10.3	8	14.1	13.3	59.3
02	209	15.5		19.5	130	53.9	10.3	8	00.8	13.3	59.3
03	224	15.3	. .	19.4	145	23.2	10.4	7	47.5	13.4	59.3
04	239	15.2		19.3	159	52.6	10.4	7	34.1	13.4	59.3
05	254	15.1		19.2	174	22.0	10.5	7	20.7	13.4	59.2
06	269	14.9	N23	19.1	188	51.5	10.6	N 7	07.3	13.5	59.2
M 07	284	14.8		19.0	203	21.1	10.6	6	53.8	13.5	59.2
I 08	299	14.7		18.9	217	50.7	10.7	6	40.3	13.5	59.2
E 09	314	14.6	. .	18.8	232	20.4	10.7	6	26.8	13.5	59.2
R 10	329	14.4		18.6	246	50.1	10.8	6	13.3	13.6	59.1
C 11	344	14.3		18.5	261	19.9	10.8	5	59.7	13.5	59.1
O 12	359	14.2	N23	18.4	275	49.7	10.9	N 5	46.2	13.6	59.1
L 13	14	14.0		18.3	290	19.6	11.0	5	32.6	13.7	59.1
E 14	29	13.9		18.2	304	49.6	11.0	5	18.9	13.6	59.0
S 15	44	13.8	. .	18.1	319	19.6	11.0	5	05.3	13.6	59.0
16	59	13.6		18.0	333	49.6	11.1	4	51.7	13.7	59.0
17	74	13.5		17.9	348	19.7	11.2	4	38.0	13.7	59.0
18	89	13.4	N23	17.8	2	49.9	11.1	N 4	24.3	13.7	58.9
19	104	13.3		17.7	17	20.0	11.3	4	10.6	13.7	58.9
20	119	13.1		17.6	31	50.3	11.3	3	56.9	13.7	58.9
21	134	13.0	. .	17.5	46	20.6	11.3	3	43.2	13.7	58.9
22	149	12.9		17.3	60	50.9	11.3	3	29.5	13.7	58.8
23	164	12.7		17.2	75	21.2	11.5	3	15.8	13.8	58.8
28 00	179	12.6	N23	17.1	89	51.7	11.4	N 3	02.0	13.7	58.8
01	194	12.5		17.0	104	22.1	11.5	2	48.3	13.7	58.8
02	209	12.4		16.9	118	52.6	11.5	2	34.6	13.8	58.7
03	224	12.2	. .	16.8	133	23.1	11.6	2	20.8	13.7	58.7
04	239	12.1		16.6	147	53.7	11.6	2	07.1	13.7	58.7
05	254	12.0		16.5	162	24.3	11.6	1	53.4	13.8	58.7
06	269	11.8	N23	16.4	176	54.9	11.7	N 1	39.6	13.7	58.6
07	284	11.7		16.3	191	25.6	11.7	1	25.9	13.7	58.6
J 08	299	11.6		16.2	205	56.3	11.7	1	12.2	13.8	58.6
U 09	314	11.5	. .	16.1	220	27.0	11.8	0	58.4	13.7	58.6
E 10	329	11.3		15.9	234	57.8	11.8	0	44.7	13.7	58.5
V 11	344	11.2		15.8	249	28.6	11.8	0	31.0	13.7	58.5
E 12	359	11.1	N23	15.7	263	59.4	11.8	N 0	17.3	13.7	58.5
S 13	14	11.0		15.6	278	30.2	11.9	N 0	03.6	13.7	58.5
14	29	10.8		15.4	293	01.1	11.9	S 0	10.1	13.6	58.4
15	44	10.7	. .	15.3	307	32.0	12.0	0	23.7	13.7	58.4
16	59	10.6		15.2	322	03.0	11.9	0	37.4	13.6	58.4
17	74	10.4		15.1	336	33.9	12.0	0	51.0	13.6	58.4
18	89	10.3	N23	14.9	351	04.9	12.0	S 1	04.6	13.6	58.3
19	104	10.2		14.8	5	35.9	12.0	1	18.2	13.6	58.3
20	119	10.1		14.7	20	06.9	12.0	1	31.8	13.6	58.3
21	134	09.9	. .	14.5	34	37.9	12.1	1	45.4	13.5	58.3
22	149	09.8		14.4	49	09.0	12.1	1	58.9	13.6	58.2
23	164	09.7		14.3	63	40.1	12.1	2	12.5	13.5	58.2
29 00	179	09.6	N23	14.2	78	11.2	12.1	S 2	26.0	13.5	58.2
01	194	09.4		14.0	92	42.3	12.1	2	39.5	13.4	58.2
02	209	09.3		13.9	107	13.4	12.1	2	52.9	13.4	58.1
03	224	09.2	. .	13.8	121	44.5	12.2	3	06.3	13.4	58.1
04	239	09.1		13.6	136	15.7	12.1	3	19.7	13.4	58.1
05	254	08.9		13.5	150	46.8	12.2	3	33.1	13.4	58.1
06	269	08.8	N23	13.4	165	18.0	12.2	S 3	46.5	13.3	58.0
07	284	08.7		13.2	179	49.2	12.2	3	59.8	13.3	58.0
V 08	299	08.6		13.1	194	20.4	12.2	4	13.1	13.2	58.0
I 09	314	08.4	. .	12.9	208	51.6	12.2	4	26.3	13.3	58.0
E 10	329	08.3		12.8	223	22.8	12.2	4	39.6	13.1	57.9
R 11	344	08.2		12.7	237	54.0	12.2	4	52.7	13.2	57.9
N 12	359	08.1	N23	12.5	252	25.2	12.2	S 5	05.9	13.1	57.9
E 13	14	07.9		12.4	266	56.4	12.3	5	19.0	13.1	57.9
S 14	29	07.8		12.2	281	27.7	12.2	5	32.1	13.0	57.8
15	44	07.7	. .	12.1	295	58.9	12.2	5	45.1	13.0	57.8
16	59	07.6		12.0	310	30.1	12.3	5	58.1	13.0	57.8
17	74	07.4		11.8	325	01.4	12.2	6	11.1	12.9	57.8
18	89	07.3	N23	11.7	339	32.6	12.2	S 6	24.0	12.9	57.7
19	104	07.2		11.5	354	03.8	12.3	6	36.9	12.8	57.7
20	119	07.1		11.4	8	35.1	12.2	6	49.7	12.8	57.7
21	134	06.9	. .	11.2	23	06.3	12.2	7	02.5	12.8	57.7
22	149	06.8		11.1	37	37.5	12.2	7	15.3	12.7	57.6
23	164	06.7		10.9	52	08.7	12.2	S 7	28.0	12.7	57.6
	SD	15.8	d	0.1	SD		16.1		15.9		15.8

Lat.	Crepúsculo Náutico	Crepúsculo Civil	Orto Sol	Orto Luna 27	Orto Luna 28	Orto Luna 29	Orto Luna 30
°	h m	h m	h m	h m	h m	h m	h m
N 72	▭	▭	▭	10 18	12 24	14 28	16 35
N 70	▭	▭	▭	10 27	12 24	14 19	16 15
68	▭	▭	▭	10 34	12 24	14 12	16 00
66	▭	▭	▭	10 40	12 24	14 06	15 48
64	////	////	01 36	10 45	12 25	14 01	15 37
62	////	////	02 13	10 50	12 25	13 57	15 29
60	////	00 57	02 39	10 54	12 25	13 54	15 21
N 58	////	01 45	02 59	10 57	12 25	13 50	15 15
56	////	02 14	03 16	11 00	12 25	13 47	15 09
54	00 52	02 36	03 30	11 03	12 25	13 45	15 04
52	01 36	02 54	03 42	11 05	12 25	13 43	14 59
50	02 04	03 09	03 53	11 07	12 25	13 41	14 55
45	02 49	03 38	04 16	11 12	12 25	13 36	14 46
N 40	03 19	04 01	04 33	11 16	12 25	13 32	14 39
35	03 42	04 19	04 48	11 19	12 25	13 29	14 32
30	04 01	04 34	05 01	11 22	12 25	13 26	14 27
20	04 30	04 59	05 23	11 28	12 25	13 21	14 17
N 10	04 52	05 19	05 42	11 32	12 25	13 17	14 09
0	05 11	05 37	06 00	11 36	12 25	13 13	14 01
S 10	05 28	05 54	06 17	11 41	12 26	13 09	13 53
20	05 44	06 11	06 35	11 45	12 26	13 05	13 45
30	06 00	06 30	06 56	11 51	12 26	13 01	13 36
35	06 09	06 41	07 09	11 53	12 26	12 58	13 30
40	06 18	06 52	07 23	11 57	12 26	12 55	13 24
45	06 28	07 06	07 39	12 01	12 26	12 52	13 17
S 50	06 40	07 22	08 00	12 05	12 27	12 47	13 09
52	06 45	07 29	08 10	12 07	12 27	12 46	13 05
54	06 51	07 37	08 21	12 10	12 27	12 44	13 01
56	06 57	07 46	08 33	12 12	12 27	12 41	12 56
58	07 04	07 56	08 48	12 15	12 27	12 39	12 51
S 60	07 11	08 08	09 05	12 18	12 27	12 36	12 46

Lat.	Ocaso Sol	Crepúsculo Civil	Crepúsculo Náutico	Ocaso Luna 27	Ocaso Luna 28	Ocaso Luna 29	Ocaso Luna 30
°	h m	h m	h m	h m	h m	h m	h m
N 72	▭	▭	▭	00 58	00 36	{00 15 / 23 54}	23 27
N 70	▭	▭	▭	00 46	00 32	00 19	{00 05 / 23 48}
68	▭	▭	▭	00 37	00 29	00 21	00 14
66	▭	▭	▭	00 29	00 26	00 24	00 21
64	22 29	////	////	00 22	00 24	00 26	00 28
62	21 52	////	////	00 16	00 22	00 28	00 34
60	21 27	23 08	////	00 11	00 21	00 29	00 38
N 58	21 07	22 21	////	00 06	00 19	00 31	00 43
56	20 50	21 52	////	00 02	00 18	00 32	00 47
54	20 36	21 30	23 13	24 16	00 16	00 33	00 50
52	20 24	21 12	22 29	24 15	00 15	00 34	00 53
50	20 13	20 57	22 02	24 14	00 14	00 35	00 56
45	19 51	20 28	21 18	24 12	00 12	00 37	01 03
N 40	19 33	20 06	20 47	24 10	00 10	00 39	01 08
35	19 18	19 48	20 24	24 09	00 09	00 41	01 13
30	19 05	19 32	20 06	24 07	00 07	00 42	01 17
20	18 43	19 08	19 37	24 04	00 04	00 44	01 24
N 10	18 24	18 47	19 14	24 02	00 02	00 46	01 30
0	18 07	18 29	18 56	24 00	00 00	00 48	01 36
S 10	17 50	18 12	18 39	23 58	24 50	00 50	01 42
20	17 31	17 55	18 23	23 55	24 52	00 52	01 48
30	17 10	17 37	18 06	23 53	24 54	00 54	01 55
35	16 58	17 26	17 58	23 51	24 56	00 56	01 59
40	16 44	17 14	17 48	23 49	24 57	00 57	02 04
45	16 27	17 01	17 38	23 47	24 59	00 59	02 10
S 50	16 07	16 45	17 26	23 44	25 01	01 01	02 16
52	15 57	16 38	17 21	23 43	25 02	01 02	02 19
54	15 46	16 30	17 16	23 42	25 03	01 03	02 23
56	15 33	16 21	17 10	23 40	25 04	01 04	02 26
58	15 19	16 10	17 03	23 39	25 05	01 05	02 30
S 60	15 01	15 59	16 55	23 37	25 07	01 07	02 35

Día	SOL E.T. (−) 00h	SOL E.T. (−) 12h	SOL Pas. Mer.	LUNA Pas. Sup.	LUNA Mer. Inf.	LUNA Edad	LUNA Fase
d	m s	m s	h m	h m	h m	d	%
27	02 57	03 03	12 03	17 48	05 23	06	43
28	03 09	03 15	12 03	18 37	06 13	07	54
29	03 22	03 28	12 03	19 25	07 01	08	65

T.U.	ARIES	VENUS −4.2		MARTE −2.2		JUPITER −1.9		SATURNO +0.1	
d h	A.H.G. ° ′	A.H.G. ° ′	Dec. ° ′	A.H.G. ° ′	Dec. ° ′	A.H.G. ° ′	Dec. ° ′	A.H.G. ° ′	Dec. ° ′
30 00	278 07.6	225 54.9	N16 03.3	21 48.1	S26 50.6	191 18.8	N23 06.7	210 44.2	N20 06.4
01	293 10.1	240 54.7	04.0	36 51.3	50.6	206 20.6	06.7	225 46.4	06.5
02	308 12.5	255 54.5	04.7	51 54.5	50.6	221 22.5	06.7	240 48.5	06.5
03	323 15.0	270 54.3 . .	05.4	66 57.7 . .	50.6	236 24.3 . .	06.7	255 50.7 . .	06.6
04	338 17.5	285 54.0	06.0	82 00.9	50.6	251 26.2	06.8	270 52.8	06.6
05	353 19.9	300 53.8	06.7	97 04.0	50.6	266 28.0	06.8	285 55.0	06.7
06	8 22.4	315 53.6	N16 07.4	112 07.2	S26 50.6	281 29.8	N23 06.8	300 57.1	N20 06.7
07	23 24.9	330 53.4	08.1	127 10.4	50.7	296 31.7	06.8	315 59.3	06.8
S 08	38 27.3	345 53.2	08.7	142 13.6	50.7	311 33.5	06.8	331 01.4	06.8
09	53 29.8	0 52.9 . .	09.4	157 16.7 . .	50.7	326 35.4 . .	06.8	346 03.6 . .	06.8
A 10	68 32.3	15 52.7	10.1	172 19.9	50.7	341 37.2	06.9	1 05.7	06.9
B 11	83 34.7	30 52.5	10.7	187 23.1	50.7	356 39.1	06.9	16 07.9	06.9
12	98 37.2	45 52.3	N16 11.4	202 26.2	S26 50.7	11 40.9	N23 06.9	31 10.0	N20 07.0
A 13	113 39.7	60 52.1	12.1	217 29.4	50.7	26 42.8	06.9	46 12.2	07.0
D 14	128 42.1	75 51.8	12.7	232 32.6	50.8	41 44.6	06.9	61 14.3	07.1
15	143 44.6	90 51.6 . .	13.4	247 35.7 . .	50.8	56 46.4 . .	06.9	76 16.5 . .	07.1
O 16	158 47.0	105 51.4	14.1	262 38.9	50.8	71 48.3	06.9	91 18.6	07.2
17	173 49.5	120 51.2	14.7	277 42.1	50.8	86 50.1	07.0	106 20.8	07.2
18	188 52.0	135 50.9	N16 15.4	292 45.2	S26 50.8	101 52.0	N23 07.0	121 22.9	N20 07.2
19	203 54.4	150 50.7	16.1	307 48.4	50.8	116 53.8	07.0	136 25.1	07.3
20	218 56.9	165 50.5	16.7	322 51.5	50.8	131 55.7	07.0	151 27.3	07.3
21	233 59.4	180 50.3 . .	17.4	337 54.7 . .	50.8	146 57.5 . .	07.0	166 29.4 . .	07.4
22	249 01.8	195 50.0	18.1	352 57.9	50.9	161 59.4	07.0	181 31.6	07.4
23	264 04.3	210 49.8	18.7	8 01.0	50.9	177 01.2	07.1	196 33.7	07.5
1 00	279 06.8	225 49.6	N16 19.4	23 04.2	S26 50.9	192 03.1	N23 07.1	211 35.9	N20 07.5
01	294 09.2	240 49.3	20.1	38 07.3	50.9	207 04.9	07.1	226 38.0	07.5
02	309 11.7	255 49.1	20.7	53 10.5	50.9	222 06.7	07.1	241 40.2	07.6
03	324 14.1	270 48.9 . .	21.4	68 13.6 . .	50.9	237 08.6 . .	07.1	256 42.3 . .	07.6
04	339 16.6	285 48.7	22.1	83 16.8	50.9	252 10.4	07.1	271 44.5	07.7
05	354 19.1	300 48.4	22.7	98 19.9	50.9	267 12.3	07.1	286 46.6	07.7
06	9 21.5	315 48.2	N16 23.4	113 23.1	S26 50.9	282 14.1	N23 07.2	301 48.8	N20 07.8
07	24 24.0	330 48.0	24.0	128 26.2	51.0	297 16.0	07.2	316 50.9	07.8
D 08	39 26.5	345 47.7	24.7	143 29.4	51.0	312 17.8	07.2	331 53.1	07.9
O 09	54 28.9	0 47.5 . .	25.4	158 32.5 . .	51.0	327 19.7 . .	07.2	346 55.3 . .	07.9
M 10	69 31.4	15 47.2	26.0	173 35.6	51.0	342 21.5	07.2	1 57.4	07.9
I 11	84 33.9	30 47.0	26.7	188 38.8	51.0	357 23.4	07.2	16 59.6	08.0
12	99 36.3	45 46.8	N16 27.3	203 41.9	S26 51.0	12 25.2	N23 07.2	32 01.7	N20 08.0
N 13	114 38.8	60 46.5	28.0	218 45.1	51.0	27 27.1	07.3	47 03.9	08.1
G 14	129 41.3	75 46.3	28.7	233 48.2	51.0	42 28.9	07.3	62 06.0	08.1
O 15	144 43.7	90 46.1 . .	29.3	248 51.3 . .	51.0	57 30.7 . .	07.3	77 08.2 . .	08.2
16	159 46.2	105 45.8	30.0	263 54.5	51.0	72 32.6	07.3	92 10.3	08.2
17	174 48.6	120 45.6	30.6	278 57.6	51.1	87 34.4	07.3	107 12.5	08.2
18	189 51.1	135 45.3	N16 31.3	294 00.7	S26 51.1	102 36.3	N23 07.3	122 14.6	N20 08.3
19	204 53.6	150 45.1	32.0	309 03.9	51.1	117 38.1	07.3	137 16.8	08.3
20	219 56.0	165 44.9	32.6	324 07.0	51.1	132 40.0	07.4	152 19.0	08.4
21	234 58.5	180 44.6 . .	33.3	339 10.1 . .	51.1	147 41.8 . .	07.4	167 21.1 . .	08.4
22	250 01.0	195 44.4	33.9	354 13.2	51.1	162 43.7	07.4	182 23.3	08.5
23	265 03.4	210 44.1	34.6	9 16.4	51.1	177 45.5	07.4	197 25.4	08.5
2 00	280 05.9	225 43.9	N16 35.2	24 19.5	S26 51.1	192 47.4	N23 07.4	212 27.6	N20 08.5
01	295 08.4	240 43.6	35.9	39 22.6	51.1	207 49.2	07.4	227 29.7	08.6
02	310 10.8	255 43.4	36.5	54 25.7	51.1	222 51.1	07.4	242 31.9	08.6
03	325 13.3	270 43.1 . .	37.2	69 28.8 . .	51.1	237 52.9 . .	07.5	257 34.0 . .	08.7
04	340 15.8	285 42.9	37.9	84 32.0	51.2	252 54.7	07.5	272 36.2	08.7
05	355 18.2	300 42.6	38.5	99 35.1	51.2	267 56.6	07.5	287 38.4	08.8
06	10 20.7	315 42.4	N16 39.2	114 38.2	S26 51.2	282 58.4	N23 07.5	302 40.5	N20 08.8
07	25 23.1	330 42.1	39.8	129 41.3	51.2	298 00.3	07.5	317 42.7	08.8
L 08	40 25.6	345 41.9	40.5	144 44.4	51.2	313 02.1	07.5	332 44.8	08.9
U 09	55 28.1	0 41.6 . .	41.1	159 47.5 . .	51.2	328 04.0 . .	07.5	347 47.0 . .	08.9
N 10	70 30.5	15 41.4	41.8	174 50.7	51.2	343 05.8	07.6	2 49.1	09.0
E 11	85 33.0	30 41.1	42.4	189 53.8	51.2	358 07.7	07.6	17 51.3	09.0
S 12	100 35.5	45 40.9	N16 43.1	204 56.9	S26 51.2	13 09.5	N23 07.6	32 53.4	N20 09.1
13	115 37.9	60 40.6	43.7	220 00.0	51.2	28 11.4	07.6	47 55.6	09.1
14	130 40.4	75 40.4	44.4	235 03.1	51.2	43 13.2	07.6	62 57.8	09.2
15	145 42.9	90 40.1 . .	45.0	250 06.2 . .	51.2	58 15.1 . .	07.6	77 59.9 . .	09.2
16	160 45.3	105 39.9	45.7	265 09.3	51.2	73 16.9	07.6	93 02.1	09.2
17	175 47.8	120 39.6	46.3	280 12.4	51.3	88 18.8	07.7	108 04.2	09.3
18	190 50.3	135 39.4	N16 47.0	295 15.5	S26 51.3	103 20.6	N23 07.7	123 06.4	N20 09.3
19	205 52.7	150 39.1	47.6	310 18.6	51.3	118 22.4	07.7	138 08.5	09.4
20	220 55.2	165 38.8	48.2	325 21.7	51.3	133 24.3	07.7	153 10.7	09.4
21	235 57.6	180 38.6 . .	48.9	340 24.8 . .	51.3	148 26.1 . .	07.7	168 12.9 . .	09.5
22	251 00.1	195 38.3	49.5	355 27.9	51.3	163 28.0	07.7	183 15.0	09.5
23	266 02.6	210 38.1	50.2	10 31.0	51.3	178 29.8	07.7	198 17.2	09.5
Pas. Mer.	h m 5 22.7	v −0.2	d 0.7	v 3.1	d 0.0	v 1.8	d 0.0	v 2.2	d 0.0

ESTRELLAS		
Nombre	A.H.S. ° ′	Dec. ° ′
Acamar	315 25.7	S40 17.8
Achernar	335 33.8	S57 13.6
Acrux	173 20.0	S63 06.6
Adhara	255 20.3	S28 58.4
Aldebaran	291 00.5	N16 30.6
Alioth	166 28.8	N55 57.5
Alkaid	153 06.1	N49 18.7
Al Na'ir	27 55.1	S46 57.1
Alnilam	275 56.2	S 1 12.1
Alphard	218 05.6	S 8 39.9
Alphecca	126 18.7	N26 42.8
Alpheratz	357 53.2	N29 05.7
Altair	62 17.1	N 8 52.3
Ankaa	353 24.9	S42 17.7
Antares	112 37.5	S26 26.1
Arcturus	146 04.1	N19 10.7
Atria	107 47.3	S69 01.9
Avior	234 22.5	S59 30.9
Bellatrix	278 42.4	N 6 21.0
Betelgeuse	271 11.8	N 7 24.4
Canopus	264 00.9	S52 41.8
Capella	280 48.8	N45 59.9
Deneb	49 37.5	N45 17.0
Denebola	182 43.3	N14 34.0
Diphda	349 05.3	S17 58.7
Dubhe	194 03.3	N61 45.0
Elnath	278 24.9	N28 36.4
Eltanin	90 50.0	N51 29.4
Enif	33 56.1	N 9 52.8
Fomalhaut	15 34.1	S29 36.8
Gacrux	172 11.5	S57 07.4
Gienah	176 02.0	S17 33.0
Hadar	149 01.1	S60 23.0
Hamal	328 11.5	N23 28.0
Kaus Aust.	83 55.9	S34 23.0
Kochab	137 18.8	N74 09.3
Markab	13 47.6	N15 12.6
Menkar	314 25.1	N 4 05.6
Menkent	148 18.6	S36 22.7
Miaplacidus	221 42.5	S69 43.5
Mirfak	308 54.2	N49 51.7
Nunki	76 09.6	S26 17.7
Peacock	53 33.4	S56 43.7
Pollux	243 39.6	N28 01.4
Procyon	245 09.9	N 5 13.3
Rasalhague	96 14.8	N12 33.6
Regulus	207 53.7	N11 57.8
Rigel	281 21.4	S 8 12.0
Rigil Kent.	140 04.4	S60 50.6
Sabik	102 23.0	S15 43.6
Schedar	349 51.4	N56 32.4
Shaula	96 34.3	S37 06.3
Sirius	258 42.4	S16 43.1
Spica	158 41.1	S11 10.1
Suhail	222 59.8	S43 26.4
Vega	80 44.9	N38 47.1
Zuben'ubi	137 15.7	S16 02.8

	A.H.S. ° ′	Pas. Mer. h m
Venus	306 42.8	8 57
Marte	103 57.4	22 23
Júpiter	272 56.3	11 10
Saturno	292 29.1	9 52

T.U.	SOL A.H.G.	SOL Dec.	LUNA A.H.G.	LUNA v	LUNA Dec.	LUNA d	LUNA P.H.
d h	° ′	° ′	° ′	′	° ′	′	′
30 00	179 06.6	N23 10.8	66 39.9	12.2	S 7 40.7	12.6	57.6
01	194 06.4	10.6	81 11.1	12.2	7 53.3	12.5	57.6
02	209 06.3	10.5	95 42.3	12.2	8 05.8	12.5	57.5
03	224 06.2	10.3	110 13.5	12.2	8 18.3	12.5	57.5
04	239 06.1	10.2	124 44.7	12.2	8 30.8	12.4	57.5
05	254 05.9	10.0	139 15.9	12.2	8 43.2	12.4	57.5
06	269 05.8	N23 09.9	153 47.1	12.1	S 8 55.6	12.3	57.4
07	284 05.7	09.7	168 18.2	12.1	9 07.9	12.2	57.4
S 08	299 05.6	09.6	182 49.3	12.2	9 20.1	12.2	57.4
A 09	314 05.5	09.4	197 20.5	12.1	9 32.3	12.1	57.4
B 10	329 05.3	09.3	211 51.6	12.1	9 44.4	12.1	57.3
A 11	344 05.2	09.1	226 22.7	12.1	9 56.5	12.0	57.3
D 12	359 05.1	N23 09.0	240 53.8	12.1	S10 08.5	12.0	57.3
O 13	14 05.0	08.8	255 24.9	12.0	10 20.5	11.9	57.3
14	29 04.8	08.6	269 55.9	12.1	10 32.4	11.8	57.2
15	44 04.7	08.5	284 27.0	12.0	10 44.2	11.8	57.2
16	59 04.6	08.3	298 58.0	12.0	10 56.0	11.7	57.2
17	74 04.5	08.2	313 29.0	12.0	11 07.7	11.7	57.2
18	89 04.4	N23 08.0	328 00.0	12.0	S11 19.4	11.6	57.2
19	104 04.2	07.8	342 31.0	11.9	11 31.0	11.5	57.1
20	119 04.1	07.7	357 01.9	12.0	11 42.5	11.5	57.1
21	134 04.0	07.5	11 32.9	11.9	11 54.0	11.4	57.1
22	149 03.9	07.4	26 03.8	11.9	12 05.4	11.3	57.1
23	164 03.7	07.2	40 34.7	11.8	12 16.7	11.2	57.0
1 00	179 03.6	N23 07.0	55 05.5	11.9	S12 27.9	11.2	57.0
01	194 03.5	06.9	69 36.4	11.8	12 39.1	11.1	57.0
02	209 03.4	06.7	84 07.2	11.8	12 50.2	11.1	57.0
03	224 03.3	06.5	98 38.0	11.8	13 01.3	11.0	56.9
04	239 03.1	06.4	113 08.8	11.8	13 12.3	10.9	56.9
05	254 03.0	06.2	127 39.6	11.7	13 23.2	10.8	56.9
06	269 02.9	N23 06.0	142 10.3	11.7	S13 34.0	10.7	56.9
07	284 02.8	05.8	156 41.0	11.7	13 44.7	10.7	56.8
D 08	299 02.7	05.7	171 11.7	11.6	13 55.4	10.6	56.8
O 09	314 02.5	05.5	185 42.3	11.7	14 06.0	10.5	56.8
M 10	329 02.4	05.3	200 13.0	11.6	14 16.5	10.5	56.8
I 11	344 02.3	05.2	214 43.6	11.6	14 27.0	10.3	56.8
N 12	359 02.2	N23 05.0	229 14.2	11.5	S14 37.3	10.3	56.7
G 13	14 02.1	04.8	243 44.7	11.5	14 47.6	10.2	56.7
O 14	29 01.9	04.6	258 15.2	11.5	14 57.8	10.1	56.7
15	44 01.8	04.5	272 45.7	11.5	15 07.9	10.1	56.7
16	59 01.7	04.3	287 16.2	11.5	15 18.0	9.9	56.6
17	74 01.6	04.1	301 46.7	11.4	15 27.9	9.9	56.6
18	89 01.5	N23 03.9	316 17.1	11.4	S15 37.8	9.8	56.6
19	104 01.3	03.7	330 47.5	11.3	15 47.6	9.7	56.6
20	119 01.2	03.6	345 17.8	11.3	15 57.3	9.6	56.6
21	134 01.1	03.4	359 48.1	11.3	16 06.9	9.5	56.5
22	149 01.0	03.2	14 18.4	11.3	16 16.4	9.5	56.5
23	164 00.9	03.0	28 48.7	11.2	16 25.9	9.3	56.5
2 00	179 00.8	N23 02.8	43 18.9	11.3	S16 35.2	9.3	56.5
01	194 00.6	02.7	57 49.2	11.1	16 44.5	9.2	56.4
02	209 00.5	02.5	72 19.3	11.2	16 53.7	9.0	56.4
03	224 00.4	02.3	86 49.5	11.1	17 02.7	9.0	56.4
04	239 00.3	02.1	101 19.6	11.1	17 11.7	8.9	56.4
05	254 00.2	01.9	115 49.7	11.1	17 20.6	8.8	56.4
06	269 00.0	N23 01.7	130 19.8	11.0	S17 29.4	8.7	56.3
07	283 59.9	01.6	144 49.8	11.0	17 38.1	8.7	56.3
08	298 59.8	01.4	159 19.8	11.0	17 46.8	8.5	56.3
L 09	313 59.7	01.2	173 49.8	10.9	17 55.3	8.4	56.3
U 10	328 59.6	01.0	188 19.7	10.9	18 03.7	8.3	56.3
N 11	343 59.5	00.8	202 49.6	10.9	18 12.0	8.3	56.2
E 12	358 59.3	N23 00.6	217 19.5	10.9	S18 20.3	8.1	56.2
S 13	13 59.2	00.4	231 49.4	10.8	18 28.4	8.0	56.2
14	28 59.1	00.2	246 19.2	10.8	18 36.4	8.0	56.2
15	43 59.0	23 00.0	260 49.0	10.8	18 44.4	7.8	56.1
16	58 58.9	22 59.8	275 18.8	10.7	18 52.2	7.8	56.1
17	73 58.8	59.6	289 48.5	10.7	19 00.0	7.6	56.1
18	88 58.7	N22 59.5	304 18.2	10.7	S19 07.6	7.5	56.1
19	103 58.5	59.3	318 47.9	10.7	19 15.1	7.5	56.1
20	118 58.4	59.1	333 17.6	10.6	19 22.6	7.3	56.0
21	133 58.3	58.9	347 47.2	10.6	19 29.9	7.2	56.0
22	148 58.2	58.7	2 16.8	10.6	19 37.1	7.1	56.0
23	163 58.1	58.5	16 46.4	10.5	S19 44.2	7.0	56.0
	SD 15.8	d 0.2	SD 15.6		15.5		15.3

Lat.	Crepúsculo Náutico	Crepúsculo Civil	Orto Sol	Orto Luna 30	Orto Luna 1	Orto Luna 2	Orto Luna 3
°	h m	h m	h m	h m	h m	h m	h m
N 72	▭	▭	▭	16 35	19 02	■	■
N 70	▭	▭	▭	16 15	18 20	21 02	■
68	▭	▭	▭	16 00	17 51	19 51	■
66	////	////	00 19	15 48	17 30	19 14	20 58
64	////	////	01 41	15 37	17 13	18 49	20 19
62	////	////	02 17	15 29	17 00	18 29	19 52
60	////	01 03	02 42	15 21	16 48	18 12	19 31
N 58	////	01 48	03 02	15 15	16 38	17 59	19 14
56	////	02 17	03 18	15 09	16 29	17 47	19 00
54	00 58	02 38	03 32	15 04	16 21	17 37	18 47
52	01 40	02 56	03 44	14 59	16 14	17 28	18 36
50	02 06	03 11	03 55	14 55	16 08	17 19	18 27
45	02 51	03 40	04 17	14 46	15 55	17 02	18 06
N 40	03 21	04 02	04 35	14 39	15 44	16 48	17 50
35	03 43	04 20	04 50	14 32	15 35	16 36	17 36
30	04 02	04 35	05 02	14 27	15 27	16 26	17 24
20	04 31	05 00	05 24	14 17	15 13	16 08	17 03
N 10	04 53	05 20	05 43	14 09	15 00	15 53	16 46
0	05 12	05 38	06 00	14 01	14 49	15 39	16 29
S 10	05 28	05 55	06 17	13 53	14 38	15 24	16 13
20	05 44	06 12	06 36	13 45	14 26	15 09	15 55
30	06 00	06 30	06 57	13 36	14 12	14 52	15 35
35	06 09	06 41	07 09	13 30	14 05	14 42	15 23
40	06 18	06 52	07 23	13 24	13 56	14 30	15 10
45	06 28	07 05	07 39	13 17	13 45	14 17	14 54
S 50	06 40	07 21	08 00	13 09	13 33	14 01	14 34
52	06 45	07 29	08 09	13 05	13 27	13 53	14 25
54	06 51	07 37	08 20	13 01	13 21	13 45	14 15
56	06 57	07 45	08 32	12 56	13 14	13 36	14 03
58	07 03	07 55	08 47	12 51	13 06	13 25	13 50
S 60	07 10	08 07	09 04	12 46	12 57	13 13	13 34

Lat.	Ocaso Sol	Crepúsculo Civil	Crepúsculo Náutico	Ocaso Luna 30	Ocaso Luna 1	Ocaso Luna 2	Ocaso Luna 3
°	h m	h m	h m	h m	h m	h m	h m
N 72	▭	▭	▭	23 27	22 41	■	■
N 70	▭	▭	▭	{00 05 / 23 48}	23 25	22 27	■
68	▭	▭	▭	00 14	{00 05 / 23 55}	23 39	■
66	23 40	////	////	00 21	00 19	00 17	00 16
64	22 25	////	////	00 28	00 31	00 35	00 43
62	21 50	////	////	00 34	00 40	00 50	01 03
60	21 25	23 02	////	00 38	00 49	01 02	01 20
N 58	21 05	22 18	////	00 43	00 56	01 13	01 34
56	20 49	21 50	////	00 47	01 03	01 22	01 46
54	20 35	21 29	23 08	00 50	01 09	01 30	01 57
52	20 23	21 11	22 27	00 53	01 14	01 38	02 07
50	20 12	20 57	22 01	00 56	01 19	01 45	02 15
45	19 50	20 28	21 17	01 03	01 30	01 59	02 33
N 40	19 33	20 05	20 47	01 08	01 38	02 11	02 48
35	19 18	19 48	20 24	01 13	01 46	02 22	03 01
30	19 05	19 32	20 06	01 17	01 52	02 31	03 12
20	18 43	19 08	19 37	01 24	02 04	02 46	03 31
N 10	18 25	18 48	19 15	01 30	02 14	03 00	03 47
0	18 08	18 30	18 56	01 36	02 24	03 13	04 03
S 10	17 50	18 13	18 39	01 42	02 33	03 25	04 18
20	17 32	17 56	18 24	01 48	02 44	03 39	04 35
30	17 11	17 38	18 07	01 55	02 55	03 55	04 54
35	16 59	17 27	17 59	01 59	03 02	04 04	05 05
40	16 45	17 16	17 50	02 04	03 10	04 15	05 18
45	16 29	17 02	17 39	02 10	03 19	04 27	05 33
S 50	16 08	16 47	17 28	02 16	03 30	04 42	05 52
52	15 59	16 39	17 23	02 19	03 35	04 50	06 01
54	15 48	16 31	17 17	02 23	03 41	04 57	06 11
56	15 35	16 22	17 11	02 26	03 47	05 06	06 22
58	15 21	16 12	17 05	02 30	03 54	05 16	06 35
S 60	15 04	16 01	16 57	02 35	04 02	05 28	06 50

Día	SOL E.T. (−) 00h	SOL E.T. (−) 12h	SOL Pas. Mer.	LUNA Pas. Sup.	LUNA Mer. Inf.	LUNA Edad	LUNA Fase
d	m s	m s	h m	h m	h m	d	%
30	03 34	03 39	12 04	20 12	07 48	09	75
1	03 45	03 51	12 04	21 01	08 36	10	84
2	03 57	04 02	12 04	21 51	09 26	11	90

T.U.	ARIES	VENUS −4.1		MARTE −2.1		JUPITER −1.9		SATURNO +0.2	
	A.H.G.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
3 00	281 05.0	225 37.8	N16 50.8	25 34.1	S26 51.3	193 31.7	N23 07.7	213 19.3	N20 09.6
01	296 07.5	240 37.5	51.5	40 37.2	51.3	208 33.5	07.8	228 21.5	09.6
02	311 10.0	255 37.3	52.1	55 40.3	51.3	223 35.4	07.8	243 23.6	09.7
03	326 12.4	270 37.0 . .	52.8	70 43.4 . .	51.3	238 37.2 . .	07.8	258 25.8 . .	09.7
04	341 14.9	285 36.8	53.4	85 46.4	51.3	253 39.1	07.8	273 27.9	09.8
05	356 17.4	300 36.5	54.0	100 49.5	51.3	268 40.9	07.8	288 30.1	09.8
06	11 19.8	315 36.2	N16 54.7	115 52.6	S26 51.3	283 42.8	N23 07.8	303 32.3	N20 09.8
07	26 22.3	330 36.0	55.3	130 55.7	51.3	298 44.6	07.8	318 34.4	09.9
M 08	41 24.7	345 35.7	56.0	145 58.8	51.3	313 46.5	07.9	333 36.6	09.9
09	56 27.2	0 35.4 . .	56.6	161 01.9 . .	51.3	328 48.3 . .	07.9	348 38.7 . .	10.0
A 10	71 29.7	15 35.2	57.2	176 04.9	51.4	343 50.2	07.9	3 40.9	10.0
R 11	86 32.1	30 34.9	57.9	191 08.0	51.4	358 52.0	07.9	18 43.1	10.0
T 12	101 34.6	45 34.6	N16 58.5	206 11.1	S26 51.4	13 53.9	N23 07.9	33 45.2	N20 10.1
13	116 37.1	60 34.4	59.2	221 14.2	51.4	28 55.7	07.9	48 47.4	10.1
E 14	131 39.5	75 34.1	16 59.8	236 17.2	51.4	43 57.6	07.9	63 49.5	10.2
15	146 42.0	90 33.8	17 00.4	251 20.3 . .	51.4	58 59.4 . .	07.9	78 51.7 . .	10.2
S 16	161 44.5	105 33.6	01.1	266 23.4	51.4	74 01.3	08.0	93 53.8	10.3
17	176 46.9	120 33.3	01.7	281 26.5	51.4	89 03.1	08.0	108 56.0	10.3
18	191 49.4	135 33.0	N17 02.4	296 29.5	S26 51.4	104 04.9	N23 08.0	123 58.2	N20 10.3
19	206 51.9	150 32.7	03.0	311 32.6	51.4	119 06.8	08.0	139 00.3	10.4
20	221 54.3	165 32.5	03.6	326 35.7	51.4	134 08.6	08.0	154 02.5	10.4
21	236 56.8	180 32.2 . .	04.3	341 38.7 . .	51.4	149 10.5 . .	08.0	169 04.6 . .	10.5
22	251 59.2	195 31.9	04.9	356 41.8	51.4	164 12.3	08.0	184 06.8	10.5
23	267 01.7	210 31.6	05.5	11 44.9	51.4	179 14.2	08.0	199 08.9	10.6
4 00	282 04.2	225 31.4	N17 06.2	26 47.9	S26 51.4	194 16.0	N23 08.1	214 11.1	N20 10.6
01	297 06.6	240 31.1	06.8	41 51.0	51.4	209 17.9	08.1	229 13.3	10.6
02	312 09.1	255 30.8	07.4	56 54.0	51.4	224 19.7	08.1	244 15.4	10.7
03	327 11.6	270 30.5 . .	08.1	71 57.1 . .	51.4	239 21.6 . .	08.1	259 17.6 . .	10.7
04	342 14.0	285 30.3	08.7	87 00.2	51.4	254 23.4	08.1	274 19.7	10.8
05	357 16.5	300 30.0	09.3	102 03.2	51.4	269 25.3	08.1	289 21.9	10.8
06	12 19.0	315 29.7	N17 10.0	117 06.3	S26 51.4	284 27.1	N23 08.1	304 24.1	N20 10.9
M 07	27 21.4	330 29.4	10.6	132 09.3	51.4	299 29.0	08.1	319 26.2	10.9
I 08	42 23.9	345 29.1	11.2	147 12.4	51.4	314 30.8	08.1	334 28.4	10.9
E 09	57 26.4	0 28.9 . .	11.8	162 15.4 . .	51.4	329 32.7 . .	08.2	349 30.5 . .	11.0
R 10	72 28.8	15 28.6	12.5	177 18.5	51.5	344 34.5	08.2	4 32.7	11.0
C 11	87 31.3	30 28.3	13.1	192 21.5	51.5	359 36.4	08.2	19 34.9	11.1
O 12	102 33.7	45 28.0	N17 13.7	207 24.6	S26 51.5	14 38.2	N23 08.2	34 37.0	N20 11.1
L 13	117 36.2	60 27.7	14.4	222 27.6	51.5	29 40.1	08.2	49 39.2	11.1
E 14	132 38.7	75 27.4	15.0	237 30.6	51.5	44 41.9	08.2	64 41.3	11.2
S 15	147 41.1	90 27.2 . .	15.6	252 33.7 . .	51.5	59 43.8 . .	08.2	79 43.5 . .	11.2
16	162 43.6	105 26.9	16.2	267 36.7	51.5	74 45.6	08.2	94 45.7	11.3
17	177 46.1	120 26.6	16.9	282 39.8	51.5	89 47.5	08.3	109 47.8	11.3
18	192 48.5	135 26.3	N17 17.5	297 42.8	S26 51.5	104 49.3	N23 08.3	124 50.0	N20 11.4
19	207 51.0	150 26.0	18.1	312 45.8	51.5	119 51.2	08.3	139 52.1	11.4
20	222 53.5	165 25.7	18.7	327 48.9	51.5	134 53.0	08.3	154 54.3	11.4
21	237 55.9	180 25.4 . .	19.4	342 51.9 . .	51.5	149 54.9 . .	08.3	169 56.5 . .	11.5
22	252 58.4	195 25.1	20.0	357 54.9	51.5	164 56.7	08.3	184 58.6	11.5
23	268 00.9	210 24.9	20.6	12 58.0	51.5	179 58.6	08.3	200 00.8	11.6
5 00	283 03.3	225 24.6	N17 21.2	28 01.0	S26 51.5	195 00.4	N23 08.3	215 02.9	N20 11.6
01	298 05.8	240 24.3	21.9	43 04.0	51.5	210 02.3	08.3	230 05.1	11.6
02	313 08.2	255 24.0	22.5	58 07.0	51.5	225 04.1	08.4	245 07.3	11.7
03	328 10.7	270 23.7 . .	23.1	73 10.1 . .	51.5	240 06.0 . .	08.4	260 09.4 . .	11.7
04	343 13.2	285 23.4	23.7	88 13.1	51.5	255 07.8	08.4	275 11.6	11.8
05	358 15.6	300 23.1	24.3	103 16.1	51.5	270 09.7	08.4	290 13.7	11.8
06	13 18.1	315 22.8	N17 25.0	118 19.1	S26 51.5	285 11.5	N23 08.4	305 15.9	N20 11.9
07	28 20.6	330 22.5	25.6	133 22.1	51.5	300 13.4	08.4	320 18.1	11.9
J 08	43 23.0	345 22.2	26.2	148 25.2	51.5	315 15.2	08.4	335 20.2	11.9
U 09	58 25.5	0 21.9 . .	26.8	163 28.2 . .	51.5	330 17.1 . .	08.4	350 22.4 . .	12.0
10	73 28.0	15 21.6	27.4	178 31.2	51.5	345 18.9	08.4	5 24.5	12.0
E 11	88 30.4	30 21.3	28.1	193 34.2	51.5	0 20.8	08.5	20 26.7	12.1
V 12	103 32.9	45 21.0	N17 28.7	208 37.2	S26 51.5	15 22.6	N23 08.5	35 28.9	N20 12.1
13	118 35.4	60 20.7	29.3	223 40.2	51.5	30 24.5	08.5	50 31.0	12.1
E 14	133 37.8	75 20.4	29.9	238 43.2	51.5	45 26.3	08.5	65 33.2	12.2
15	148 40.3	90 20.1 . .	30.5	253 46.2 . .	51.5	60 28.2 . .	08.5	80 35.3 . .	12.2
S 16	163 42.7	105 19.8	31.1	268 49.2	51.5	75 30.0	08.5	95 37.5	12.3
17	178 45.2	120 19.5	31.7	283 52.3	51.5	90 31.9	08.5	110 39.7	12.3
18	193 47.7	135 19.2	N17 32.4	298 55.3	S26 51.5	105 33.7	N23 08.5	125 41.8	N20 12.3
19	208 50.1	150 18.9	33.0	313 58.3	51.5	120 35.6	08.5	140 44.0	12.4
20	223 52.6	165 18.6	33.6	329 01.3	51.5	135 37.4	08.5	155 46.2	12.4
21	238 55.1	180 18.3 . .	34.2	344 04.3 . .	51.5	150 39.3 . .	08.6	170 48.3 . .	12.5
22	253 57.5	195 18.0	34.8	359 07.3	51.5	165 41.1	08.6	185 50.5	12.5
23	269 00.0	210 17.7	35.4	14 10.3	51.5	180 43.0	08.6	200 52.6	12.6
	h m								
Pas. Mer.	5 10.9	*v* −0.3	*d* 0.6	*v* 3.0	*d* 0.0	*v* 1.8	*d* 0.0	*v* 2.2	*d* 0.0

ESTRELLAS

Nombre	A.H.S.	Dec.
	° ′	° ′
Acamar	315 25.7	S40 17.8
Achernar	335 33.8	S57 13.6
Acrux	173 20.0	S63 06.6
Adhara	255 20.3	S28 58.4
Aldebaran	291 00.5	N16 30.6
Alioth	166 28.8	N55 57.5
Alkaid	153 06.1	N49 18.7
Al Na'ir	27 55.1	S46 57.1
Alnilam	275 56.2	S 1 12.1
Alphard	218 05.6	S 8 39.8
Alphecca	126 18.7	N26 42.8
Alpheratz	357 53.2	N29 05.7
Altair	62 17.1	N 8 52.3
Ankaa	353 24.9	S42 17.7
Antares	112 37.5	S26 26.1
Arcturus	146 04.2	N19 10.7
Atria	107 47.3	S69 01.9
Avior	234 22.5	S59 30.9
Bellatrix	278 42.4	N 6 21.0
Betelgeuse	271 11.8	N 7 24.4
Canopus	264 00.9	S52 41.8
Capella	280 48.8	N45 59.8
Deneb	49 37.5	N45 17.0
Denebola	182 43.3	N14 34.0
Diphda	349 05.3	S17 58.7
Dubhe	194 03.4	N61 44.9
Elnath	278 24.9	N28 36.4
Eltanin	90 50.0	N51 29.4
Enif	33 56.1	N 9 52.8
Fomalhaut	15 34.1	S29 36.8
Gacrux	172 11.5	S57 07.4
Gienah	176 02.0	S17 33.0
Hadar	149 01.1	S60 23.0
Hamal	328 11.5	N23 28.0
Kaus Aust.	83 55.8	S34 23.0
Kochab	137 18.9	N74 09.3
Markab	13 47.6	N15 12.7
Menkar	314 25.1	N 4 05.6
Menkent	148 18.6	S36 22.7
Miaplacidus	221 42.6	S69 43.5
Mirfak	308 54.2	N49 51.7
Nunki	76 09.6	S26 17.7
Peacock	53 33.4	S56 43.7
Pollux	243 39.6	N28 01.4
Procyon	245 09.9	N 5 13.3
Rasalhague	96 14.8	N12 33.6
Regulus	207 53.7	N11 57.8
Rigel	281 21.4	S 8 12.0
Rigil Kent.	140 04.5	S60 50.6
Sabik	102 23.0	S15 43.6
Schedar	349 51.3	N56 32.4
Shaula	96 34.3	S37 06.3
Sirius	258 42.4	S16 43.0
Spica	158 41.1	S11 10.1
Suhail	222 59.8	S43 26.4
Vega	80 44.9	N38 47.1
Zuben'ubi	137 15.7	S16 02.8

	A.H.S.	Pas. Mer.
	° ′	h m
Venus	303 27.2	8 58
Marte	104 43.7	22 08
Júpiter	272 11.9	11 02
Saturno	292 06.9	9 42

T.U.	SOL				LUNA					
	A.H.G.		Dec.		A.H.G.	v	Dec.	d	P.H.	
d h	°	′	°	′	°	′	′	°	′	′	′
MARTES 3 00	178	58.0	N22	58.3	31	15.9	10.5	S19	51.2	7.0	56.0
01	193	57.8		58.1	45	45.4	10.5	19	58.2	6.8	55.9
02	208	57.7		57.9	60	14.9	10.5	20	05.0	6.7	55.9
03	223	57.6	. .	57.7	74	44.4	10.4	20	11.7	6.6	55.9
04	238	57.5		57.5	89	13.8	10.4	20	18.3	6.4	55.9
05	253	57.4		57.3	103	43.2	10.4	20	24.7	6.4	55.9
06	268	57.3	N22	57.1	118	12.6	10.4	S20	31.1	6.3	55.8
07	283	57.2		56.9	132	42.0	10.3	20	37.4	6.1	55.8
08	298	57.0		56.7	147	11.3	10.4	20	43.5	6.1	55.8
09	313	56.9	. .	56.4	161	40.7	10.3	20	49.6	5.9	55.8
10	328	56.8		56.2	176	10.0	10.2	20	55.5	5.9	55.8
11	343	56.7		56.0	190	39.2	10.3	21	01.4	5.7	55.7
12	358	56.6	N22	55.8	205	08.5	10.2	S21	07.1	5.6	55.7
13	13	56.5		55.6	219	37.7	10.2	21	12.7	5.5	55.7
14	28	56.4		55.4	234	06.9	10.2	21	18.2	5.3	55.7
15	43	56.2	. .	55.2	248	36.1	10.2	21	23.5	5.3	55.7
16	58	56.1		55.0	263	05.3	10.1	21	28.8	5.2	55.6
17	73	56.0		54.8	277	34.4	10.2	21	34.0	5.0	55.6
18	88	55.9	N22	54.6	292	03.6	10.1	S21	39.0	4.9	55.6
19	103	55.8		54.4	306	32.7	10.1	21	43.9	4.8	55.6
20	118	55.7		54.1	321	01.8	10.1	21	48.7	4.7	55.6
21	133	55.6	. .	53.9	335	30.9	10.1	21	53.4	4.6	55.5
22	148	55.5		53.7	350	00.0	10.0	21	58.0	4.5	55.5
23	163	55.4		53.5	4	29.0	10.1	22	02.5	4.3	55.5
MIERCOLES 4 00	178	55.2	N22	53.3	18	58.1	10.0	S22	06.8	4.3	55.5
01	193	55.1		53.1	33	27.1	10.0	22	11.1	4.1	55.5
02	208	55.0		52.9	47	56.1	10.0	22	15.2	4.0	55.5
03	223	54.9	. .	52.6	62	25.1	10.0	22	19.2	3.9	55.4
04	238	54.8		52.4	76	54.1	10.0	22	23.1	3.8	55.4
05	253	54.7		52.2	91	23.1	10.0	22	26.9	3.6	55.4
06	268	54.6	N22	52.0	105	52.1	9.9	S22	30.5	3.5	55.4
07	283	54.5		51.8	120	21.0	10.0	22	34.0	3.4	55.4
08	298	54.4		51.5	134	50.0	9.9	22	37.4	3.3	55.3
09	313	54.2	. .	51.3	149	18.9	10.0	22	40.7	3.2	55.3
10	328	54.1		51.1	163	47.9	9.9	22	43.9	3.1	55.3
11	343	54.0		50.9	178	16.8	9.9	22	47.0	2.9	55.3
12	358	53.9	N22	50.7	192	45.7	10.0	S22	49.9	2.8	55.3
13	13	53.8		50.4	207	14.7	9.9	22	52.7	2.8	55.3
14	28	53.7		50.2	221	43.6	9.9	22	55.5	2.5	55.2
15	43	53.6	. .	50.0	236	12.5	9.9	22	58.0	2.5	55.2
16	58	53.5		49.8	250	41.4	10.0	23	00.5	2.3	55.2
17	73	53.4		49.5	265	10.4	9.9	23	02.8	2.3	55.2
18	88	53.3	N22	49.3	279	39.3	9.9	S23	05.1	2.1	55.2
19	103	53.1		49.1	294	08.2	10.0	23	07.2	2.0	55.2
20	118	53.0		48.8	308	37.2	9.9	23	09.2	1.8	55.1
21	133	52.9	. .	48.6	323	06.1	9.9	23	11.0	1.8	55.1
22	148	52.8		48.4	337	35.0	10.0	23	12.8	1.6	55.1
23	163	52.7		48.1	352	04.0	9.9	23	14.4	1.5	55.1
JUEVES 5 00	178	52.6	N22	47.9	6	32.9	10.0	S23	15.9	1.4	55.1
01	193	52.5		47.7	21	01.9	9.9	23	17.3	1.3	55.1
02	208	52.4		47.5	35	30.8	10.0	23	18.6	1.2	55.0
03	223	52.3	. .	47.2	49	59.8	10.0	23	19.8	1.0	55.0
04	238	52.2		47.0	64	28.8	10.0	23	20.8	0.9	55.0
05	253	52.1		46.7	78	57.8	10.0	23	21.7	0.8	55.0
06	268	52.0	N22	46.5	93	26.8	10.0	S23	22.5	0.7	55.0
07	283	51.8		46.3	107	55.8	10.0	23	23.2	0.5	55.0
08	298	51.7		46.0	122	24.8	10.1	23	23.7	0.5	54.9
09	313	51.6	. .	45.8	136	53.9	10.0	23	24.2	0.3	54.9
10	328	51.5		45.6	151	22.9	10.1	23	24.5	0.2	54.9
11	343	51.4		45.3	165	52.0	10.1	23	24.7	0.1	54.9
12	358	51.3	N22	45.1	180	21.1	10.1	S23	24.8	0.1	54.9
13	13	51.2		44.8	194	50.2	10.2	23	24.7	0.1	54.9
14	28	51.1		44.6	209	19.4	10.1	23	24.6	0.3	54.9
15	43	51.0	. .	44.4	223	48.5	10.2	23	24.3	0.4	54.8
16	58	50.9		44.1	238	17.7	10.2	23	23.9	0.5	54.8
17	73	50.8		43.9	252	46.9	10.2	23	23.4	0.6	54.8
18	88	50.7	N22	43.6	267	16.1	10.2	S23	22.8	0.7	54.8
19	103	50.6		43.4	281	45.3	10.3	23	22.1	0.9	54.8
20	118	50.5		43.1	296	14.6	10.3	23	21.2	1.0	54.8
21	133	50.4	. .	42.9	310	43.9	10.3	23	20.2	1.1	54.8
22	148	50.3		42.6	325	13.2	10.4	23	19.1	1.2	54.7
23	163	50.2		42.4	339	42.6	10.3	S23	17.9	1.3	54.7
	SD	15.8	d	0.2	SD	15.2		15.1		15.0	

Lat.	Crepúsculo Náutico	Crepúsculo Civil	Orto Sol	Orto Luna 3	Orto Luna 4	Orto Luna 5	Orto Luna 6
°	h m	h m	h m	h m	h m	h m	h m
N 72	▭	▭	▭	▬	▬	▬	▬
N 70	▭	▭	▭	▬	▬	▬	▬
68	▭	▭	▭	▬	▬	▬	▬
66	////	////	00 41	20 58	22 33	23 27	23 39
64	////	////	01 47	20 19	21 37	22 30	22 59
62	////	////	02 21	19 52	21 04	21 57	22 32
60	////	01 11	02 46	19 31	20 40	21 33	22 10
N 58	////	01 53	03 05	19 14	20 20	21 13	21 53
56	////	02 21	03 21	19 00	20 04	20 57	21 38
54	01 05	02 42	03 35	18 47	19 50	20 43	21 25
52	01 44	02 59	03 47	18 36	19 38	20 31	21 14
50	02 10	03 13	03 57	18 27	19 28	20 20	21 04
45	02 53	03 42	04 19	18 06	19 05	19 58	20 43
N 40	03 23	04 04	04 36	17 50	18 48	19 40	20 26
35	03 45	04 21	04 51	17 36	18 33	19 25	20 12
30	04 03	04 36	05 04	17 24	18 20	19 12	19 59
20	04 32	05 01	05 25	17 03	17 57	18 49	19 38
N 10	04 54	05 21	05 44	16 46	17 38	18 30	19 19
0	05 12	05 38	06 01	16 29	17 20	18 12	19 02
S 10	05 29	05 55	06 18	16 13	17 03	17 54	18 45
20	05 44	06 12	06 36	15 55	16 44	17 34	18 26
30	06 00	06 30	06 56	15 35	16 22	17 12	18 05
35	06 09	06 40	07 08	15 23	16 09	16 59	17 52
40	06 18	06 52	07 22	15 10	15 54	16 44	17 38
45	06 28	07 05	07 39	14 54	15 37	16 26	17 21
S 50	06 39	07 20	07 59	14 34	15 15	16 04	16 59
52	06 44	07 28	08 08	14 25	15 05	15 53	16 49
54	06 50	07 36	08 19	14 15	14 53	15 41	16 38
56	06 56	07 44	08 31	14 03	14 40	15 27	16 24
58	07 02	07 54	08 45	13 50	14 25	15 11	16 09
S 60	07 09	08 05	09 02	13 34	14 06	14 51	15 51

Lat.	Ocaso Sol	Crepúsculo Civil	Crepúsculo Náutico	Ocaso Luna 3	Ocaso Luna 4	Ocaso Luna 5	Ocaso Luna 6
°	h m	h m	h m	h m	h m	h m	h m
N 72	▭	▭	▭	▬	▬	▬	▬
N 70	▭	▭	▭	▬	▬	▬	▬
68	▭	▭	▭	▬	▬	▬	▬
66	23 22	////	////	00 16	00 18	00 30	01 23
64	22 20	////	////	00 43	00 57	01 27	02 20
62	21 47	////	////	01 03	01 25	02 00	02 53
60	21 22	22 55	////	01 20	01 46	02 24	03 17
N 58	21 03	22 14	////	01 34	02 04	02 44	03 36
56	20 47	21 47	////	01 46	02 18	03 00	03 53
54	20 34	21 27	23 01	01 57	02 31	03 14	04 06
52	20 22	21 10	22 24	02 07	02 42	03 26	04 18
50	20 11	20 55	21 58	02 15	02 52	03 37	04 29
45	19 50	20 27	21 15	02 33	03 13	03 59	04 51
N 40	19 32	20 05	20 46	02 48	03 30	04 17	05 09
35	19 18	19 47	20 23	03 01	03 44	04 32	05 24
30	19 05	19 32	20 05	03 12	03 57	04 45	05 37
20	18 44	19 08	19 37	03 31	04 18	05 08	05 59
N 10	18 25	18 48	19 15	03 47	04 37	05 27	06 18
0	18 08	18 30	18 57	04 03	04 54	05 45	06 36
S 10	17 51	18 14	18 40	04 18	05 11	06 03	06 54
20	17 33	17 57	18 24	04 35	05 30	06 23	07 13
30	17 12	17 39	18 08	04 54	05 51	06 45	07 35
35	17 00	17 28	18 00	05 05	06 04	06 58	07 48
40	16 47	17 17	17 51	05 18	06 18	07 13	08 03
45	16 30	17 04	17 41	05 33	06 35	07 31	08 20
S 50	16 10	16 49	17 30	05 52	06 56	07 53	08 42
52	16 01	16 41	17 25	06 01	07 07	08 04	08 52
54	15 50	16 34	17 19	06 11	07 18	08 16	09 04
56	15 38	16 25	17 13	06 22	07 31	08 30	09 17
58	15 24	16 15	17 07	06 35	07 46	08 46	09 32
S 60	15 07	16 04	17 00	06 50	08 04	09 06	09 51

Día	SOL E.T. (−) 00h	SOL E.T. (−) 12h	SOL Pas. Mer.	LUNA Pas. Sup.	LUNA Mer. Inf.	LUNA Edad	LUNA Fase
d	m s	m s	h m	h m	h m	d	%
3	04 08	04 13	12 04	22 41	10 16	12	96
4	04 19	04 24	12 04	23 33	11 07	13	99
5	04 29	04 35	12 05	24 24	11 59	14	100

T.U.	ARIES	VENUS −4.1		MARTE −2.0		JUPITER −1.9		SATURNO +0.2	
	A.H.G.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
6 00	284 02.5	225 17.4	N17 36.0	29 13.2	S26 51.5	195 44.8	N23 08.6	215 54.8	N20 12.6
01	299 04.9	240 17.1	36.6	44 16.2	51.5	210 46.7	08.6	230 57.0	12.6
02	314 07.4	255 16.8	37.3	59 19.2	51.5	225 48.5	08.6	245 59.1	12.7
03	329 09.9	270 16.5 . .	37.9	74 22.2 . .	51.5	240 50.4 . .	08.6	261 01.3 . .	12.7
04	344 12.3	285 16.2	38.5	89 25.2	51.5	255 52.2	08.6	276 03.5	12.8
05	359 14.8	300 15.8	39.1	104 28.2	51.5	270 54.1	08.6	291 05.6	12.8
06	14 17.2	315 15.5	N17 39.7	119 31.2	S26 51.5	285 55.9	N23 08.6	306 07.8	N20 12.8
07	29 19.7	330 15.2	40.3	134 34.2	51.5	300 57.8	08.7	321 09.9	12.9
08	44 22.2	345 14.9	40.9	149 37.1	51.5	315 59.6	08.7	336 12.1	12.9
V 09	59 24.6	0 14.6 . .	41.5	164 40.1 . .	51.5	331 01.5 . .	08.7	351 14.3 . .	13.0
I 10	74 27.1	15 14.3	42.1	179 43.1	51.5	346 03.3	08.7	6 16.4	13.0
E 11	89 29.6	30 14.0	42.7	194 46.1	51.5	1 05.2	08.7	21 18.6	13.0
R 12	104 32.0	45 13.7	N17 43.3	209 49.1	S26 51.5	16 07.0	N23 08.7	36 20.8	N20 13.1
N 13	119 34.5	60 13.4	43.9	224 52.0	51.5	31 08.9	08.7	51 22.9	13.1
E 14	134 37.0	75 13.0	44.5	239 55.0	51.5	46 10.7	08.7	66 25.1	13.2
S 15	149 39.4	90 12.7 . .	45.1	254 58.0 . .	51.5	61 12.6 . .	08.7	81 27.2 . .	13.2
16	164 41.9	105 12.4	45.7	270 01.0	51.5	76 14.4	08.7	96 29.4	13.2
17	179 44.3	120 12.1	46.3	285 03.9	51.5	91 16.3	08.8	111 31.6	13.3
18	194 46.8	135 11.8	N17 46.9	300 06.9	S26 51.5	106 18.1	N23 08.8	126 33.7	N20 13.3
19	209 49.3	150 11.5	47.5	315 09.9	51.5	121 20.0	08.8	141 35.9	13.4
20	224 51.7	165 11.1	48.1	330 12.8	51.5	136 21.8	08.8	156 38.1	13.4
21	239 54.2	180 10.8 . .	48.7	345 15.8 . .	51.5	151 23.7 . .	08.8	171 40.2 . .	13.5
22	254 56.7	195 10.5	49.3	0 18.8	51.5	166 25.5	08.8	186 42.4	13.5
23	269 59.1	210 10.2	49.9	15 21.7	51.5	181 27.4	08.8	201 44.6	13.5
7 00	285 01.6	225 09.9	N17 50.5	30 24.7	S26 51.5	196 29.2	N23 08.8	216 46.7	N20 13.6
01	300 04.1	240 09.5	51.1	45 27.6	51.5	211 31.1	08.8	231 48.9	13.6
02	315 06.5	255 09.2	51.7	60 30.6	51.5	226 32.9	08.8	246 51.0	13.7
03	330 09.0	270 08.9 . .	52.3	75 33.6 . .	51.5	241 34.8 . .	08.8	261 53.2 . .	13.7
04	345 11.5	285 08.6	52.9	90 36.5	51.5	256 36.6	08.9	276 55.4	13.7
05	0 13.9	300 08.2	53.5	105 39.5	51.5	271 38.5	08.9	291 57.5	13.8
06	15 16.4	315 07.9	N17 54.1	120 42.4	S26 51.5	286 40.4	N23 08.9	306 59.7	N20 13.8
07	30 18.8	330 07.6	54.7	135 45.4	51.5	301 42.2	08.9	322 01.9	13.9
S 08	45 21.3	345 07.3	55.3	150 48.3	51.5	316 44.1	08.9	337 04.0	13.9
A 09	60 23.8	0 06.9 . .	55.9	165 51.3 . .	51.5	331 45.9 . .	08.9	352 06.2 . .	13.9
B 10	75 26.2	15 06.6	56.5	180 54.2	51.5	346 47.8	08.9	7 08.4	14.0
A 11	90 28.7	30 06.3	57.1	195 57.1	51.5	1 49.6	08.9	22 10.5	14.0
12	105 31.2	45 05.9	N17 57.7	211 00.1	S26 51.5	16 51.5	N23 08.9	37 12.7	N20 14.1
D 13	120 33.6	60 05.6	58.3	226 03.0	51.5	31 53.3	08.9	52 14.9	14.1
O 14	135 36.1	75 05.3	58.9	241 06.0	51.5	46 55.2	08.9	67 17.0	14.1
15	150 38.6	90 05.0 17	59.5	256 08.9 . .	51.5	61 57.0 . .	09.0	82 19.2 . .	14.2
16	165 41.0	105 04.6 18	00.0	271 11.8	51.5	76 58.9	09.0	97 21.3	14.2
17	180 43.5	120 04.3	00.6	286 14.8	51.4	92 00.7	09.0	112 23.5	14.3
18	195 46.0	135 04.0	N18 01.2	301 17.7	S26 51.4	107 02.6	N23 09.0	127 25.7	N20 14.3
19	210 48.4	150 03.6	01.8	316 20.6	51.4	122 04.4	09.0	142 27.8	14.3
20	225 50.9	165 03.3	02.4	331 23.6	51.4	137 06.3	09.0	157 30.0	14.4
21	240 53.3	180 03.0 . .	03.0	346 26.5 . .	51.4	152 08.1 . .	09.0	172 32.2 . .	14.4
22	255 55.8	195 02.6	03.6	1 29.4	51.4	167 10.0	09.0	187 34.3	14.5
23	270 58.3	210 02.3	04.2	16 32.4	51.4	182 11.8	09.0	202 36.5	14.5
8 00	286 00.7	225 02.0	N18 04.7	31 35.3	S26 51.4	197 13.7	N23 09.0	217 38.7	N20 14.5
01	301 03.2	240 01.6	05.3	46 38.2	51.4	212 15.6	09.0	232 40.8	14.6
02	316 05.7	255 01.3	05.9	61 41.1	51.4	227 17.4	09.0	247 43.0	14.6
03	331 08.1	270 00.9 . .	06.5	76 44.0 . .	51.4	242 19.3 . .	09.1	262 45.2 . .	14.7
04	346 10.6	285 00.6	07.1	91 47.0	51.4	257 21.1	09.1	277 47.3	14.7
05	1 13.1	300 00.3	07.7	106 49.9	51.4	272 23.0	09.1	292 49.5	14.7
06	16 15.5	314 59.9	N18 08.2	121 52.8	S26 51.4	287 24.8	N23 09.1	307 51.7	N20 14.8
07	31 18.0	329 59.6	08.8	136 55.7	51.4	302 26.7	09.1	322 53.8	14.8
D 08	46 20.5	344 59.2	09.4	151 58.6	51.4	317 28.5	09.1	337 56.0	14.9
O 09	61 22.9	359 58.9 . .	10.0	167 01.5 . .	51.4	332 30.4 . .	09.1	352 58.2 . .	14.9
M 10	76 25.4	14 58.6	10.6	182 04.4	51.4	347 32.2	09.1	8 00.3	14.9
I 11	91 27.8	29 58.2	11.1	197 07.3	51.4	2 34.1	09.1	23 02.5	15.0
N 12	106 30.3	44 57.9	N18 11.7	212 10.3	S26 51.4	17 35.9	N23 09.1	38 04.7	N20 15.0
G 13	121 32.8	59 57.5	12.3	227 13.2	51.4	32 37.8	09.1	53 06.8	15.1
O 14	136 35.2	74 57.2	12.9	242 16.1	51.4	47 39.6	09.1	68 09.0	15.1
15	151 37.7	89 56.8 . .	13.5	257 19.0 . .	51.4	62 41.5 . .	09.1	83 11.2 . .	15.1
16	166 40.2	104 56.5	14.0	272 21.9	51.4	77 43.4	09.2	98 13.3	15.2
17	181 42.6	119 56.1	14.6	287 24.8	51.4	92 45.2	09.2	113 15.5	15.2
18	196 45.1	134 55.8	N18 15.2	302 27.7	S26 51.4	107 47.1	N23 09.2	128 17.7	N20 15.3
19	211 47.6	149 55.5	15.8	317 30.6	51.4	122 48.9	09.2	143 19.8	15.3
20	226 50.0	164 55.1	16.3	332 33.4	51.4	137 50.8	09.2	158 22.0	15.3
21	241 52.5	179 54.8 . .	16.9	347 36.3 . .	51.4	152 52.6 . .	09.2	173 24.2 . .	15.4
22	256 54.9	194 54.4	17.5	2 39.2	51.4	167 54.5	09.2	188 26.3	15.4
23	271 57.4	209 54.1	18.1	17 42.1	51.4	182 56.3	09.2	203 28.5	15.5
Pas. Mer.	h m 4 59.1	v −0.3	d 0.6	v 2.9	d 0.0	v 1.9	d 0.0	v 2.2	d 0.0

ESTRELLAS

Nombre	A.H.S. ° ′	Dec. ° ′
Acamar	315 25.6	S40 17.8
Achernar	335 33.8	S57 13.6
Acrux	173 20.0	S63 06.6
Adhara	255 20.3	S28 58.4
Aldebaran	291 00.4	N16 30.7
Alioth	166 28.8	N55 57.5
Alkaid	153 06.1	N49 18.7
Al Na'ir	27 55.1	S46 57.1
Alnilam	275 56.2	S 1 12.1
Alphard	218 05.6	S 8 39.8
Alphecca	126 18.7	N26 42.8
Alpheratz	357 53.2	N29 05.7
Altair	62 17.0	N 8 52.3
Ankaa	353 24.8	S42 17.7
Antares	112 37.5	S26 26.1
Arcturus	146 04.2	N19 10.7
Atria	107 47.3	S69 01.9
Avior	234 22.5	S59 30.9
Bellatrix	278 42.4	N 6 21.0
Betelgeuse	271 11.8	N 7 24.4
Canopus	264 00.9	S52 41.7
Capella	280 48.8	N45 59.8
Deneb	49 37.5	N45 17.0
Denebola	182 43.3	N14 34.0
Diphda	349 05.2	S17 58.7
Dubhe	194 03.4	N61 44.9
Elnath	278 24.8	N28 36.4
Eltanin	90 50.0	N51 29.4
Enif	33 56.1	N 9 52.8
Fomalhaut	15 34.1	S29 36.8
Gacrux	172 11.6	S57 07.4
Gienah	176 02.0	S17 33.0
Hadar	149 01.1	S60 23.0
Hamal	328 11.5	N23 28.0
Kaus Aust.	83 55.8	S34 23.0
Kochab	137 18.9	N74 09.3
Markab	13 47.5	N15 12.7
Menkar	314 25.0	N 4 05.7
Menkent	148 18.6	S36 22.7
Miaplacidus	221 42.6	S69 43.5
Mirfak	308 54.2	N49 51.7
Nunki	76 09.5	S26 17.7
Peacock	53 33.3	S56 43.7
Pollux	243 39.6	N28 01.4
Procyon	245 09.9	N 5 13.3
Rasalhague	96 14.8	N12 33.6
Regulus	207 53.7	N11 57.8
Rigel	281 21.4	S 8 12.0
Rigil Kent.	140 04.5	S60 50.6
Sabik	102 23.0	S15 43.6
Schedar	349 51.3	N56 32.4
Shaula	96 34.3	S37 06.3
Sirius	258 42.4	S16 43.0
Spica	158 41.1	S11 10.1
Suhail	222 59.8	S43 26.4
Vega	80 44.9	N38 47.2
Zuben'ubi	137 15.7	S16 02.8

	A.H.S. ° ′	Pas. Mer. h m
Venus	300 08.3	9 00
Marte	105 23.1	21 54
Júpiter	271 27.6	10 53
Saturno	291 45.1	9 32

T.U.	SOL				LUNA					
	A.H.G.		Dec.		A.H.G.	v	Dec.	d	P.H.	
d h	°	′	°	′	°	′	′	°	′	′	′
6 00	178	50.0	N22	42.1	354	11.9	10.4	S23	16.6	1.4	54.7
01	193	49.9		41.9	8	41.3	10.5	23	15.2	1.6	54.7
02	208	49.8		41.6	23	10.8	10.4	23	13.6	1.6	54.7
03	223	49.7	. .	41.4	37	40.2	10.5	23	12.0	1.8	54.7
04	238	49.6		41.1	52	09.7	10.5	23	10.2	1.9	54.7
05	253	49.5		40.9	66	39.2	10.6	23	08.3	2.0	54.6
06	268	49.4	N22	40.6	81	08.8	10.6	S23	06.3	2.1	54.6
07	283	49.3		40.4	95	38.4	10.6	23	04.2	2.2	54.6
V 08	298	49.2		40.1	110	08.0	10.7	23	02.0	2.4	54.6
I 09	313	49.1	. .	39.9	124	37.7	10.6	22	59.6	2.4	54.6
E 10	328	49.0		39.6	139	07.3	10.8	22	57.2	2.6	54.6
R 11	343	48.9		39.4	153	37.1	10.7	22	54.6	2.7	54.6
N 12	358	48.8	N22	39.1	168	06.8	10.8	S22	51.9	2.7	54.6
E 13	13	48.7		38.9	182	36.6	10.9	22	49.2	2.9	54.5
S 14	28	48.6		38.6	197	06.5	10.9	22	46.3	3.0	54.5
15	43	48.5	. .	38.3	211	36.4	10.9	22	43.3	3.1	54.5
16	58	48.4		38.1	226	06.3	11.0	22	40.2	3.3	54.5
17	73	48.3		37.8	240	36.3	11.0	22	36.9	3.3	54.5
18	88	48.2	N22	37.6	255	06.3	11.0	S22	33.6	3.4	54.5
19	103	48.1		37.3	269	36.3	11.1	22	30.2	3.5	54.5
20	118	48.0		37.0	284	06.4	11.1	22	26.7	3.7	54.5
21	133	47.9	. .	36.8	298	36.5	11.2	22	23.0	3.7	54.4
22	148	47.8		36.5	313	06.7	11.2	22	19.3	3.9	54.4
23	163	47.7		36.2	327	36.9	11.3	22	15.4	4.0	54.4
7 00	178	47.6	N22	36.0	342	07.2	11.3	S22	11.4	4.0	54.4
01	193	47.5		35.7	356	37.5	11.3	22	07.4	4.2	54.4
02	208	47.4		35.5	11	07.8	11.4	22	03.2	4.2	54.4
03	223	47.3	. .	35.2	25	38.2	11.5	21	59.0	4.4	54.4
04	238	47.2		34.9	40	08.7	11.4	21	54.6	4.5	54.4
05	253	47.1		34.6	54	39.1	11.6	21	50.1	4.6	54.4
06	268	47.0	N22	34.4	69	09.7	11.6	S21	45.5	4.6	54.3
07	283	46.9		34.1	83	40.3	11.6	21	40.9	4.8	54.3
S 08	298	46.8		33.8	98	10.9	11.7	21	36.1	4.9	54.3
A 09	313	46.7	. .	33.6	112	41.6	11.7	21	31.2	4.9	54.3
B 10	328	46.6		33.3	127	12.3	11.8	21	26.3	5.1	54.3
A 11	343	46.5		33.0	141	43.1	11.8	21	21.2	5.2	54.3
D 12	358	46.4	N22	32.8	156	13.9	11.9	S21	16.0	5.2	54.3
O 13	13	46.3		32.5	170	44.8	11.9	21	10.8	5.4	54.3
14	28	46.2		32.2	185	15.7	12.0	21	05.4	5.4	54.3
15	43	46.1	. .	31.9	199	46.7	12.0	21	00.0	5.6	54.3
16	58	46.0		31.7	214	17.7	12.1	20	54.4	5.6	54.3
17	73	45.9		31.4	228	48.8	12.1	20	48.8	5.7	54.2
18	88	45.8	N22	31.1	243	19.9	12.2	S20	43.1	5.9	54.2
19	103	45.7		30.8	257	51.1	12.2	20	37.2	5.9	54.2
20	118	45.6		30.5	272	22.3	12.3	20	31.3	6.0	54.2
21	133	45.5	. .	30.3	286	53.6	12.3	20	25.3	6.1	54.2
22	148	45.4		30.0	301	24.9	12.4	20	19.2	6.1	54.2
23	163	45.3		29.7	315	56.3	12.5	20	13.1	6.3	54.2
8 00	178	45.2	N22	29.4	330	27.8	12.5	S20	06.8	6.4	54.2
01	193	45.1		29.1	344	59.3	12.5	20	00.4	6.4	54.2
02	208	45.0		28.9	359	30.8	12.6	19	54.0	6.6	54.2
03	223	44.9	. .	28.6	14	02.4	12.6	19	47.4	6.6	54.2
04	238	44.8		28.3	28	34.0	12.7	19	40.8	6.7	54.2
05	253	44.7		28.0	43	05.7	12.8	19	34.1	6.8	54.2
06	268	44.6	N22	27.7	57	37.5	12.8	S19	27.3	6.9	54.2
07	283	44.5		27.4	72	09.3	12.8	19	20.4	6.9	54.2
08	298	44.4		27.2	86	41.1	12.9	19	13.5	7.1	54.1
D 09	313	44.3	. .	26.9	101	13.0	13.0	19	06.4	7.1	54.1
O 10	328	44.2		26.6	115	45.0	13.0	18	59.3	7.2	54.1
M 11	343	44.2		26.3	130	17.0	13.1	18	52.1	7.3	54.1
I 12	358	44.1	N22	26.0	144	49.1	13.1	S18	44.8	7.4	54.1
N 13	13	44.0		25.7	159	21.2	13.1	18	37.4	7.4	54.1
G 14	28	43.9		25.4	173	53.3	13.3	18	30.0	7.5	54.1
O 15	43	43.8	. .	25.1	188	25.6	13.2	18	22.5	7.6	54.1
16	58	43.7		24.8	202	57.8	13.3	18	14.9	7.7	54.1
17	73	43.6		24.5	217	30.1	13.4	18	07.2	7.8	54.1
18	88	43.5	N22	24.3	232	02.5	13.4	S17	59.4	7.8	54.1
19	103	43.4		24.0	246	34.9	13.5	17	51.6	7.9	54.1
20	118	43.3		23.7	261	07.4	13.5	17	43.7	8.0	54.1
21	133	43.2	. .	23.4	275	39.9	13.6	17	35.7	8.0	54.1
22	148	43.1		23.1	290	12.5	13.6	17	27.7	8.2	54.1
23	163	43.0		22.8	304	45.1	13.7	S17	19.5	8.2	54.1
	SD	15.8	d	0.3	SD	14.9		14.8			14.7

Lat.	Crepúsculo Náutico	Crepúsculo Civil	Orto Sol	Orto Luna 6	Orto Luna 7	Orto Luna 8	Orto Luna 9
°	h m	h m	h m	h m	h m	h m	h m
N 72	▭	▭	▭	▬	▬	▬	01 29
N 70	▭	▭	▭	▬	▬	01 57	00 37
68	▭	▭	▭	▬	▬	00 20	{00 04 / 23 54}
66	////	////	00 58	23 39	23 41	23 40	23 38
64	////	////	01 54	22 59	23 14	23 21	23 25
62	////	////	02 26	22 32	22 53	23 06	23 14
60	////	01 20	02 50	22 10	22 35	22 53	23 05
N 58	////	01 59	03 09	21 53	22 21	22 41	22 57
56	////	02 25	03 24	21 38	22 09	22 32	22 49
54	01 13	02 45	03 38	21 25	21 58	22 23	22 43
52	01 49	03 02	03 49	21 14	21 48	22 15	22 37
50	02 14	03 16	03 59	21 04	21 39	22 08	22 32
45	02 56	03 44	04 21	20 43	21 21	21 53	22 20
N 40	03 25	04 06	04 38	20 26	21 06	21 40	22 11
35	03 47	04 23	04 53	20 12	20 53	21 30	22 03
30	04 05	04 38	05 05	19 59	20 42	21 20	21 55
20	04 33	05 02	05 26	19 38	20 23	21 04	21 43
N 10	04 55	05 21	05 44	19 19	20 06	20 50	21 32
0	05 13	05 39	06 01	19 02	19 51	20 37	21 21
S 10	05 29	05 55	06 18	18 45	19 35	20 24	21 11
20	05 45	06 12	06 36	18 26	19 18	20 10	21 00
30	06 00	06 30	06 56	18 05	18 59	19 53	20 47
35	06 09	06 40	07 08	17 52	18 48	19 44	20 40
40	06 17	06 51	07 22	17 38	18 35	19 33	20 31
45	06 27	07 04	07 38	17 21	18 19	19 20	20 21
S 50	06 38	07 19	07 57	16 59	18 00	19 04	20 09
52	06 43	07 26	08 07	16 49	17 51	18 57	20 04
54	06 48	07 34	08 17	16 38	17 41	18 49	19 57
56	06 54	07 43	08 29	16 24	17 30	18 39	19 51
58	07 00	07 52	08 43	16 09	17 17	18 29	19 43
S 60	07 07	08 03	08 59	15 51	17 01	18 17	19 34

Lat.	Ocaso Sol	Crepúsculo Civil	Crepúsculo Náutico	Ocaso Luna 6	Ocaso Luna 7	Ocaso Luna 8	Ocaso Luna 9
°	h m	h m	h m	h m	h m	h m	h m
N 72	▭	▭	▭	▬	▬	▬	04 22
N 70	▭	▭	▭	▬	▬	02 18	05 13
68	▭	▭	▭	▬	▬	03 54	05 45
66	23 08	////	////	01 23	02 55	04 32	06 08
64	22 14	////	////	02 20	03 34	04 59	06 26
62	21 42	////	////	02 53	04 02	05 20	06 41
60	21 19	22 48	////	03 17	04 23	05 36	06 53
N 58	21 00	22 10	////	03 36	04 40	05 50	07 04
56	20 45	21 44	////	03 53	04 54	06 03	07 13
54	20 32	21 24	22 54	04 06	05 07	06 13	07 21
52	20 20	21 07	22 19	04 18	05 18	06 22	07 29
50	20 10	20 53	21 55	04 29	05 28	06 31	07 35
45	19 49	20 25	21 13	04 51	05 48	06 48	07 49
N 40	19 31	20 04	20 45	05 09	06 05	07 02	08 01
35	19 17	19 46	20 23	05 24	06 19	07 15	08 11
30	19 05	19 32	20 05	05 37	06 31	07 25	08 19
20	18 44	19 08	19 37	05 59	06 51	07 43	08 34
N 10	18 25	18 48	19 15	06 18	07 09	07 59	08 47
0	18 09	18 31	18 57	06 36	07 26	08 13	08 59
S 10	17 52	18 15	18 41	06 54	07 42	08 28	09 11
20	17 34	17 58	18 25	07 13	08 00	08 43	09 23
30	17 14	17 40	18 10	07 35	08 20	09 01	09 37
35	17 02	17 30	18 01	07 48	08 32	09 11	09 46
40	16 48	17 19	17 53	08 03	08 46	09 23	09 55
45	16 33	17 06	17 43	08 20	09 02	09 36	10 06
S 50	16 13	16 51	17 32	08 42	09 21	09 53	10 19
52	16 04	16 44	17 27	08 52	09 30	10 01	10 25
54	15 53	16 36	17 22	09 04	09 41	10 10	10 32
56	15 41	16 27	17 16	09 17	09 53	10 19	10 40
58	15 27	16 18	17 10	09 32	10 06	10 30	10 48
S 60	15 11	16 07	17 03	09 51	10 22	10 43	10 58

Día	SOL E.T. (−) 00h	SOL E.T. (−) 12h	SOL Pas. Mer.	LUNA Pas. Mer. Sup.	LUNA Pas. Mer. Inf.	LUNA Edad	LUNA Fase
d	m s	m s	h m	h m	h m	d	%
6	04 40	04 45	12 05	00 24	12 49	15	99
7	04 49	04 54	12 05	01 14	13 38	16	97
8	04 59	05 04	12 05	02 02	14 25	17	92

T.U.	ARIES	VENUS −4.1		MARTE −2.0		JUPITER −1.9		SATURNO +0.2	
	A.H.G.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
9 00	286 59.9	224 53.7	N18 18.6	32 45.0	S26 51.3	197 58.2	N23 09.2	218 30.7	N20 15.5
01	302 02.3	239 53.3	19.2	47 47.9	51.3	213 00.0	09.2	233 32.8	15.5
02	317 04.8	254 53.0	19.8	62 50.8	51.3	228 01.9	09.2	248 35.0	15.6
03	332 07.3	269 52.6	. . 20.3	77 53.7	. . 51.3	243 03.7	. . 09.2	263 37.2	. . 15.6
04	347 09.7	284 52.3	20.9	92 56.5	51.3	258 05.6	09.2	278 39.3	15.6
05	2 12.2	299 51.9	21.5	107 59.4	51.3	273 07.5	09.2	293 41.5	15.7
06	17 14.7	314 51.6	N18 22.0	123 02.3	S26 51.3	288 09.3	N23 09.3	308 43.7	N20 15.7
07	32 17.1	329 51.2	22.6	138 05.2	51.3	303 11.2	09.3	323 45.9	15.8
08	47 19.6	344 50.9	23.2	153 08.1	51.3	318 13.0	09.3	338 48.0	15.8
L 09	62 22.1	359 50.5	. . 23.7	168 10.9	. . 51.3	333 14.9	. . 09.3	353 50.2	. . 15.8
U 10	77 24.5	14 50.2	24.3	183 13.8	51.3	348 16.7	09.3	8 52.4	15.9
N 11	92 27.0	29 49.8	24.9	198 16.7	51.3	3 18.6	09.3	23 54.5	15.9
E 12	107 29.4	44 49.4	N18 25.4	213 19.5	S26 51.3	18 20.4	N23 09.3	38 56.7	N20 16.0
S 13	122 31.9	59 49.1	26.0	228 22.4	51.3	33 22.3	09.3	53 58.9	16.0
14	137 34.4	74 48.7	26.6	243 25.3	51.3	48 24.1	09.3	69 01.0	16.0
15	152 36.8	89 48.4	. . 27.1	258 28.2	. . 51.3	63 26.0	. . 09.3	84 03.2	. . 16.1
16	167 39.3	104 48.0	27.7	273 31.0	51.3	78 27.9	09.3	99 05.4	16.1
17	182 41.8	119 47.6	28.3	288 33.9	51.3	93 29.7	09.3	114 07.5	16.2
18	197 44.2	134 47.3	N18 28.8	303 36.7	S26 51.3	108 31.6	N23 09.3	129 09.7	N20 16.2
19	212 46.7	149 46.9	29.4	318 39.6	51.3	123 33.4	09.3	144 11.9	16.2
20	227 49.2	164 46.6	29.9	333 42.5	51.3	138 35.3	09.3	159 14.0	16.3
21	242 51.6	179 46.2	. . 30.5	348 45.3	. . 51.3	153 37.1	. . 09.4	174 16.2	. . 16.3
22	257 54.1	194 45.8	31.1	3 48.2	51.3	168 39.0	09.4	189 18.4	16.3
23	272 56.6	209 45.5	31.6	18 51.0	51.3	183 40.8	09.4	204 20.6	16.4
10 00	287 59.0	224 45.1	N18 32.2	33 53.9	S26 51.2	198 42.7	N23 09.4	219 22.7	N20 16.4
01	303 01.5	239 44.7	32.7	48 56.7	51.2	213 44.6	09.4	234 24.9	16.5
02	318 03.9	254 44.4	33.3	63 59.6	51.2	228 46.4	09.4	249 27.1	16.5
03	333 06.4	269 44.0	. . 33.9	79 02.4	. . 51.2	243 48.3	. . 09.4	264 29.2	. . 16.5
04	348 08.9	284 43.6	34.4	94 05.3	51.2	258 50.1	09.4	279 31.4	16.6
05	3 11.3	299 43.3	35.0	109 08.1	51.2	273 52.0	09.4	294 33.6	16.6
06	18 13.8	314 42.9	N18 35.5	124 10.9	S26 51.2	288 53.8	N23 09.4	309 35.7	N20 16.7
07	33 16.3	329 42.5	36.1	139 13.8	51.2	303 55.7	09.4	324 37.9	16.7
M 08	48 18.7	344 42.1	36.6	154 16.6	51.2	318 57.5	09.4	339 40.1	16.7
A 09	63 21.2	359 41.8	. . 37.2	169 19.5	. . 51.2	333 59.4	. . 09.4	354 42.3	. . 16.8
R 10	78 23.7	14 41.4	37.7	184 22.3	51.2	349 01.3	09.4	9 44.4	16.8
T 11	93 26.1	29 41.0	38.3	199 25.1	51.2	4 03.1	09.4	24 46.6	16.9
E 12	108 28.6	44 40.7	N18 38.8	214 28.0	S26 51.2	19 05.0	N23 09.4	39 48.8	N20 16.9
S 13	123 31.0	59 40.3	39.4	229 30.8	51.2	34 06.8	09.5	54 50.9	16.9
14	138 33.5	74 39.9	39.9	244 33.6	51.2	49 08.7	09.5	69 53.1	17.0
15	153 36.0	89 39.5	. . 40.5	259 36.5	. . 51.2	64 10.5	. . 09.5	84 55.3	. . 17.0
16	168 38.4	104 39.2	41.0	274 39.3	51.2	79 12.4	09.5	99 57.4	17.0
17	183 40.9	119 38.8	41.6	289 42.1	51.2	94 14.3	09.5	114 59.6	17.1
18	198 43.4	134 38.4	N18 42.1	304 44.9	S26 51.2	109 16.1	N23 09.5	130 01.8	N20 17.1
19	213 45.8	149 38.0	42.7	319 47.8	51.2	124 18.0	09.5	145 04.0	17.2
20	228 48.3	164 37.6	43.2	334 50.6	51.1	139 19.8	09.5	160 06.1	17.2
21	243 50.8	179 37.3	. . 43.8	349 53.4	. . 51.1	154 21.7	. . 09.5	175 08.3	. . 17.2
22	258 53.2	194 36.9	44.3	4 56.2	51.1	169 23.5	09.5	190 10.5	17.3
23	273 55.7	209 36.5	44.9	19 59.0	51.1	184 25.4	09.5	205 12.6	17.3
11 00	288 58.2	224 36.1	N18 45.4	35 01.8	S26 51.1	199 27.3	N23 09.5	220 14.8	N20 17.3
01	304 00.6	239 35.7	45.9	50 04.6	51.1	214 29.1	09.5	235 17.0	17.4
02	319 03.1	254 35.4	46.5	65 07.5	51.1	229 31.0	09.5	250 19.2	17.4
03	334 05.5	269 35.0	. . 47.0	80 10.3	. . 51.1	244 32.8	. . 09.5	265 21.3	. . 17.5
04	349 08.0	284 34.6	47.6	95 13.1	51.1	259 34.7	09.5	280 23.5	17.5
05	4 10.5	299 34.2	48.1	110 15.9	51.1	274 36.5	09.5	295 25.7	17.5
06	19 12.9	314 33.8	N18 48.6	125 18.7	S26 51.1	289 38.4	N23 09.5	310 27.9	N20 17.6
07	34 15.4	329 33.5	49.2	140 21.5	51.1	304 40.3	09.6	325 30.0	17.6
M 08	49 17.9	344 33.1	49.7	155 24.3	51.1	319 42.1	09.6	340 32.2	17.7
I 09	64 20.3	359 32.7	. . 50.3	170 27.1	. . 51.1	334 44.0	. . 09.6	355 34.4	. . 17.7
E 10	79 22.8	14 32.3	50.8	185 29.9	51.1	349 45.8	09.6	10 36.5	17.7
R 11	94 25.3	29 31.9	51.3	200 32.7	51.1	4 47.7	09.6	25 38.7	17.8
C 12	109 27.7	44 31.5	N18 51.9	215 35.5	S26 51.1	19 49.5	N23 09.6	40 40.9	N20 17.8
O 13	124 30.2	59 31.1	52.4	230 38.3	51.1	34 51.4	09.6	55 43.1	17.8
L 14	139 32.7	74 30.7	52.9	245 41.1	51.1	49 53.3	09.6	70 45.2	17.9
E 15	154 35.1	89 30.4	. . 53.5	260 43.9	. . 51.0	64 55.1	. . 09.6	85 47.4	. . 17.9
S 16	169 37.6	104 30.0	54.0	275 46.6	51.0	79 57.0	09.6	100 49.6	18.0
17	184 40.0	119 29.6	54.5	290 49.4	51.0	94 58.8	09.6	115 51.8	18.0
18	199 42.5	134 29.2	N18 55.1	305 52.2	S26 51.0	110 00.7	N23 09.6	130 53.9	N20 18.0
19	214 45.0	149 28.8	55.6	320 55.0	51.0	125 02.5	09.6	145 56.1	18.1
20	229 47.4	164 28.4	56.1	335 57.8	51.0	140 04.4	09.6	160 58.3	18.1
21	244 49.9	179 28.0	. . 56.7	351 00.6	. . 51.0	155 06.3	. . 09.6	176 00.4	. . 18.1
22	259 52.4	194 27.6	57.2	6 03.3	51.0	170 08.1	09.6	191 02.6	18.2
23	274 54.8	209 27.2	57.7	21 06.1	51.0	185 10.0	09.6	206 04.8	18.2
	h m								
Pas. Mer.	4 47.3	*v* −0.4	*d* 0.6	*v* 2.8	*d* 0.0	*v* 1.9	*d* 0.0	*v* 2.2	*d* 0.0

ESTRELLAS

Nombre	A.H.S. ° ′	Dec. ° ′
Acamar	315 25.6	S40 17.8
Achernar	335 33.7	S57 13.5
Acrux	173 20.1	S63 06.6
Adhara	255 20.3	S28 58.4
Aldebaran	291 00.4	N16 30.7
Alioth	166 28.8	N55 57.5
Alkaid	153 06.1	N49 18.7
Al Na'ir	27 55.0	S46 57.1
Alnilam	275 56.2	S 1 12.1
Alphard	218 05.6	S 8 39.8
Alphecca	126 18.7	N26 42.8
Alpheratz	357 53.1	N29 05.7
Altair	62 17.0	N 8 52.3
Ankaa	353 24.8	S42 17.7
Antares	112 37.5	S26 26.1
Arcturus	146 04.2	N19 10.7
Atria	107 47.3	S69 01.9
Avior	234 22.5	S59 30.9
Bellatrix	278 42.4	N 6 21.0
Betelgeuse	271 11.8	N 7 24.4
Canopus	264 00.9	S52 41.7
Capella	280 48.8	N45 59.8
Deneb	49 37.5	N45 17.0
Denebola	182 43.3	N14 34.0
Diphda	349 05.2	S17 58.7
Dubhe	194 03.4	N61 44.9
Elnath	278 24.8	N28 36.4
Eltanin	90 50.0	N51 29.5
Enif	33 56.1	N 9 52.8
Fomalhaut	15 34.0	S29 36.8
Gacrux	172 11.6	S57 07.4
Gienah	176 02.1	S17 33.0
Hadar	149 01.2	S60 23.0
Hamal	328 11.5	N23 28.0
Kaus Aust.	83 55.8	S34 23.0
Kochab	137 19.0	N74 09.3
Markab	13 47.5	N15 12.7
Menkar	314 25.0	N 4 05.7
Menkent	148 18.6	S36 22.7
Miaplacidus	221 42.6	S69 43.5
Mirfak	308 54.1	N49 51.7
Nunki	76 09.5	S26 17.7
Peacock	53 33.3	S56 43.7
Pollux	243 39.5	N28 01.4
Procyon	245 09.9	N 5 13.3
Rasalhague	96 14.8	N12 33.6
Regulus	207 53.7	N11 57.8
Rigel	281 21.4	S 8 12.0
Rigil Kent.	140 04.5	S60 50.6
Sabik	102 23.0	S15 43.6
Schedar	349 51.3	N56 32.4
Shaula	96 34.3	S37 06.3
Sirius	258 42.4	S16 43.0
Spica	158 41.1	S11 10.1
Suhail	222 59.8	S43 26.3
Vega	80 44.9	N38 47.2
Zuben'ubi	137 15.7	S16 02.8

	A.H.S. ° ′	Pas. Mer. h m
Venus	296 46.1	9 01
Marte	105 54.9	21 40
Júpiter	270 43.7	10 44
Saturno	291 23.7	9 21

T.U.	SOL				LUNA						
	A.H.G.		Dec.		A.H.G.	v	Dec.		d	P.H.	
d h	°	′	°	′	°	′	′	°	′	′	′
9 00	178	42.9	N22	22.5	319	17.8	13.7	S17	11.3	8.2	54.1
01	193	42.8		22.2	333	50.5	13.8	17	03.1	8.4	54.1
02	208	42.7		21.9	348	23.3	13.8	16	54.7	8.4	54.1
03	223	42.7	. .	21.6	2	56.1	13.9	16	46.3	8.5	54.1
04	238	42.6		21.3	17	29.0	13.9	16	37.8	8.5	54.1
05	253	42.5		21.0	32	01.9	13.9	16	29.3	8.6	54.1
06	268	42.4	N22	20.7	46	34.8	14.0	S16	20.7	8.7	54.1
07	283	42.3		20.4	61	07.8	14.1	16	12.0	8.8	54.1
L 08	298	42.2		20.1	75	40.9	14.1	16	03.2	8.8	54.1
09	313	42.1	. .	19.8	90	14.0	14.1	15	54.4	8.9	54.1
U 10	328	42.0		19.5	104	47.1	14.2	15	45.5	8.9	54.1
11	343	41.9		19.2	119	20.3	14.3	15	36.6	9.0	54.1
N 12	358	41.8	N22	18.9	133	53.6	14.3	S15	27.6	9.1	54.1
E 13	13	41.7		18.6	148	26.9	14.3	15	18.5	9.1	54.1
14	28	41.6		18.3	163	00.2	14.4	15	09.4	9.2	54.1
S 15	43	41.6	. .	17.9	177	33.6	14.4	15	00.2	9.3	54.1
16	58	41.5		17.6	192	07.0	14.4	14	50.9	9.3	54.1
17	73	41.4		17.3	206	40.4	14.5	14	41.6	9.4	54.1
18	88	41.3	N22	17.0	221	13.9	14.6	S14	32.2	9.4	54.1
19	103	41.2		16.7	235	47.5	14.6	14	22.8	9.5	54.1
20	118	41.1		16.4	250	21.1	14.6	14	13.3	9.6	54.1
21	133	41.0	. .	16.1	264	54.7	14.6	14	03.7	9.6	54.1
22	148	40.9		15.8	279	28.3	14.8	13	54.1	9.7	54.1
23	163	40.8		15.5	294	02.1	14.7	13	44.4	9.7	54.1
10 00	178	40.8	N22	15.2	308	35.8	14.8	S13	34.7	9.8	54.1
01	193	40.7		14.8	323	09.6	14.8	13	24.9	9.8	54.1
02	208	40.6		14.5	337	43.4	14.9	13	15.1	9.9	54.1
03	223	40.5	. .	14.2	352	17.3	14.9	13	05.2	9.9	54.1
04	238	40.4		13.9	6	51.2	14.9	12	55.3	10.0	54.1
05	253	40.3		13.6	21	25.1	15.0	12	45.3	10.1	54.1
06	268	40.2	N22	13.3	35	59.1	15.0	S12	35.2	10.0	54.1
07	283	40.1		12.9	50	33.1	15.0	12	25.2	10.2	54.1
M 08	298	40.1		12.6	65	07.1	15.1	12	15.0	10.2	54.1
A 09	313	40.0	. .	12.3	79	41.2	15.1	12	04.8	10.2	54.1
10	328	39.9		12.0	94	15.3	15.1	11	54.6	10.3	54.1
R 11	343	39.8		11.7	108	49.4	15.2	11	44.3	10.4	54.1
T 12	358	39.7	N22	11.3	123	23.6	15.2	S11	33.9	10.3	54.1
13	13	39.6		11.0	137	57.8	15.2	11	23.6	10.5	54.1
E 14	28	39.5		10.7	152	32.0	15.3	11	13.1	10.5	54.1
15	43	39.4	. .	10.4	167	06.3	15.2	11	02.6	10.5	54.2
S 16	58	39.4		10.1	181	40.5	15.4	10	52.1	10.5	54.2
17	73	39.3		09.7	196	14.9	15.3	10	41.6	10.7	54.2
18	88	39.2	N22	09.4	210	49.2	15.4	S10	30.9	10.6	54.2
19	103	39.1		09.1	225	23.6	15.4	10	20.3	10.7	54.2
20	118	39.0		08.8	239	58.0	15.4	10	09.6	10.8	54.2
21	133	38.9	. .	08.4	254	32.4	15.4	9	58.8	10.7	54.2
22	148	38.9		08.1	269	06.8	15.5	9	48.1	10.9	54.2
23	163	38.8		07.8	283	41.3	15.5	9	37.2	10.8	54.2
11 00	178	38.7	N22	07.4	298	15.8	15.5	S 9	26.4	10.9	54.2
01	193	38.6		07.1	312	50.3	15.6	9	15.5	11.0	54.2
02	208	38.5		06.8	327	24.9	15.5	9	04.5	10.9	54.2
03	223	38.4	. .	06.4	341	59.4	15.6	8	53.6	11.1	54.3
04	238	38.3		06.1	356	34.0	15.6	8	42.5	11.0	54.3
05	253	38.3		05.8	11	08.6	15.6	8	31.5	11.1	54.3
06	268	38.2	N22	05.5	25	43.2	15.6	S 8	20.4	11.1	54.3
M 07	283	38.1		05.1	40	17.8	15.7	8	09.3	11.2	54.3
I 08	298	38.0		04.8	54	52.5	15.7	7	58.1	11.2	54.3
E 09	313	37.9	. .	04.5	69	27.2	15.6	7	46.9	11.2	54.3
R 10	328	37.8		04.1	84	01.8	15.7	7	35.7	11.3	54.3
C 11	343	37.8		03.8	98	36.5	15.7	7	24.4	11.3	54.3
O 12	358	37.7	N22	03.4	113	11.2	15.8	S 7	13.1	11.3	54.4
L 13	13	37.6		03.1	127	46.0	15.7	7	01.8	11.4	54.4
E 14	28	37.5		02.8	142	20.7	15.7	6	50.4	11.4	54.4
S 15	43	37.4	. .	02.4	156	55.4	15.8	6	39.0	11.4	54.4
16	58	37.4		02.1	171	30.2	15.8	6	27.6	11.5	54.4
17	73	37.3		01.7	186	05.0	15.7	6	16.1	11.4	54.4
18	88	37.2	N22	01.4	200	39.7	15.8	S 6	04.7	11.5	54.4
19	103	37.1		01.1	215	14.5	15.8	5	53.2	11.6	54.4
20	118	37.0		00.7	229	49.3	15.8	5	41.6	11.6	54.5
21	133	37.0	. .	00.4	244	24.1	15.8	5	30.0	11.5	54.5
22	148	36.9	22	00.0	258	58.9	15.8	5	18.5	11.7	54.5
23	163	36.8	N21	59.7	273	33.7	15.8	S 5	06.8	11.6	54.5
	SD	15.8	d	0.3	SD		14.7		14.8		14.8

Lat.	Crepúsculo Náutico	Crepúsculo Civil	Orto Sol	Orto Luna 9	Orto Luna 10	Orto Luna 11	Orto Luna 12
°	h m	h m	h m	h m	h m	h m	h m
N 72	▭	▭	▭	01 29	00 39	{00 / 23} {11 / 50}	23 31
N 70	▭	▭	▭	00 37	{00 / 23} {13 / 57}	23 43	23 31
68	▭	▭	▭	{00 / 23} {04 / 54}	23 45	23 38	23 31
66	////	////	01 12	23 38	23 36	23 33	23 30
64	////	////	02 01	23 25	23 28	23 29	23 30
62	////	////	02 32	23 14	23 21	23 25	23 30
60	////	01 29	02 55	23 05	23 14	23 22	23 30
N 58	////	02 05	03 13	22 57	23 09	23 20	23 29
56	////	02 30	03 28	22 49	23 04	23 17	23 29
54	01 22	02 49	03 41	22 43	23 00	23 15	23 29
52	01 55	03 05	03 52	22 37	22 56	23 13	23 29
50	02 18	03 19	04 02	22 32	22 52	23 11	23 29
45	02 59	03 47	04 23	22 20	22 45	23 07	23 29
N 40	03 27	04 08	04 40	22 11	22 38	23 04	23 28
35	03 49	04 25	04 54	22 03	22 32	23 01	23 28
30	04 07	04 39	05 06	21 55	22 27	22 58	23 28
20	04 34	05 03	05 27	21 43	22 19	22 53	23 28
N 10	04 55	05 22	05 45	21 32	22 11	22 49	23 28
0	05 13	05 39	06 02	21 21	22 04	22 46	23 27
S 10	05 29	05 56	06 18	21 11	21 57	22 42	23 27
20	05 45	06 12	06 36	21 00	21 49	22 38	23 27
30	06 00	06 30	06 56	20 47	21 40	22 33	23 27
35	06 08	06 39	07 07	20 40	21 35	22 31	23 27
40	06 17	06 50	07 20	20 31	21 30	22 28	23 27
45	06 26	07 03	07 36	20 21	21 23	22 24	23 26
S 50	06 37	07 18	07 55	20 09	21 15	22 20	23 26
52	06 42	07 25	08 05	20 04	21 11	22 18	23 26
54	06 47	07 32	08 15	19 57	21 07	22 16	23 26
56	06 52	07 41	08 26	19 51	21 02	22 14	23 26
58	06 58	07 50	08 40	19 43	20 57	22 11	23 26
S 60	07 05	08 00	08 55	19 34	20 51	22 08	23 26

Lat.	Ocaso Sol	Crepúsculo Civil	Crepúsculo Náutico	Ocaso Luna 9	Ocaso Luna 10	Ocaso Luna 11	Ocaso Luna 12
°	h m	h m	h m	h m	h m	h m	h m
N 72	▭	▭	▭	04 22	06 44	08 40	10 28
N 70	▭	▭	▭	05 13	07 08	08 52	10 33
68	▭	▭	▭	05 45	07 26	09 02	10 36
66	22 54	////	////	06 08	07 41	09 10	10 39
64	22 07	////	////	06 26	07 52	09 17	10 41
62	21 37	////	////	06 41	08 02	09 23	10 43
60	21 15	22 39	////	06 53	08 11	09 28	10 45
N 58	20 57	22 04	////	07 04	08 18	09 33	10 47
56	20 42	21 40	////	07 13	08 25	09 36	10 48
54	20 29	21 20	22 47	07 21	08 31	09 40	10 50
52	20 18	21 04	22 15	07 29	08 36	09 43	10 51
50	20 08	20 51	21 51	07 35	08 41	09 46	10 52
45	19 47	20 23	21 11	07 49	08 51	09 52	10 54
N 40	19 30	20 02	20 43	08 01	08 59	09 58	10 56
35	19 16	19 45	20 21	08 11	09 07	10 02	10 58
30	19 04	19 31	20 04	08 19	09 13	10 06	10 59
20	18 43	19 08	19 36	08 34	09 24	10 13	11 02
N 10	18 26	18 48	19 15	08 47	09 33	10 19	11 04
0	18 09	18 31	18 57	08 59	09 42	10 24	11 06
S 10	17 53	18 15	18 41	09 11	09 51	10 30	11 08
20	17 35	17 59	18 26	09 23	10 00	10 35	11 10
30	17 15	17 41	18 11	09 37	10 11	10 42	11 12
35	17 04	17 31	18 03	09 46	10 17	10 46	11 13
40	16 50	17 21	17 54	09 55	10 24	10 50	11 15
45	16 35	17 08	17 45	10 06	10 32	10 55	11 17
S 50	16 16	16 53	17 34	10 19	10 41	11 01	11 19
52	16 06	16 46	17 29	10 25	10 46	11 03	11 20
54	15 56	16 39	17 24	10 32	10 50	11 06	11 21
56	15 45	16 31	17 19	10 40	10 56	11 09	11 22
58	15 31	16 21	17 13	10 48	11 02	11 13	11 23
S 60	15 16	16 11	17 06	10 58	11 08	11 17	11 24

Día	SOL E.T. (−) 00h	SOL E.T. (−) 12h	SOL Pas. Mer.	LUNA Pas. Sup.	LUNA Mer. Inf.	LUNA Edad	LUNA Fase
d	m s	m s	h m	h m	h m	d	%
9	05 08	05 12	12 05	02 48	15 10	18	87
10	05 17	05 21	12 05	03 32	15 53	19	80
11	05 25	05 29	12 05	04 14	16 35	20	72

T.U.	ARIES	VENUS −4.1		MARTE −1.9		JUPITER −1.9		SATURNO +0.2	
	A.H.G.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
12 00	289 57.3	224 26.8	N18 58.3	36 08.9	S26 51.0	200 11.8	N23 09.6	221 07.0	N20 18.3
01	304 59.8	239 26.4	58.8	51 11.7	51.0	215 13.7	09.6	236 09.1	18.3
02	320 02.2	254 26.0	59.3	66 14.4	51.0	230 15.6	09.6	251 11.3	18.3
03	335 04.7	269 25.6	18 59.8	81 17.2	51.0	245 17.4	09.6	266 13.5	18.4
04	350 07.1	284 25.2	19 00.4	96 20.0	51.0	260 19.3	09.6	281 15.7	18.4
05	5 09.6	299 24.8	00.9	111 22.8	51.0	275 21.1	09.7	296 17.8	18.4
06	20 12.1	314 24.4	N19 01.4	126 25.5	S26 51.0	290 23.0	N23 09.7	311 20.0	N20 18.5
07	35 14.5	329 24.0	01.9	141 28.3	51.0	305 24.8	09.7	326 22.2	18.5
J 08	50 17.0	344 23.6	02.5	156 31.1	51.0	320 26.7	09.7	341 24.4	18.6
U 09	65 19.5	359 23.2	03.0	171 33.8	50.9	335 28.6	09.7	356 26.5	18.6
E 10	80 21.9	14 22.8	03.5	186 36.6	50.9	350 30.4	09.7	11 28.7	18.6
V 11	95 24.4	29 22.4	04.0	201 39.3	50.9	5 32.3	09.7	26 30.9	18.7
12	110 26.9	44 22.0	N19 04.6	216 42.1	S26 50.9	20 34.1	N23 09.7	41 33.1	N20 18.7
E 13	125 29.3	59 21.6	05.1	231 44.8	50.9	35 36.0	09.7	56 35.2	18.7
S 14	140 31.8	74 21.2	05.6	246 47.6	50.9	50 37.9	09.7	71 37.4	18.8
15	155 34.3	89 20.8	06.1	261 50.4	50.9	65 39.7	09.7	86 39.6	18.8
16	170 36.7	104 20.4	06.6	276 53.1	50.9	80 41.6	09.7	101 41.8	18.9
17	185 39.2	119 20.0	07.1	291 55.9	50.9	95 43.4	09.7	116 43.9	18.9
18	200 41.6	134 19.6	N19 07.7	306 58.6	S26 50.9	110 45.3	N23 09.7	131 46.1	N20 18.9
19	215 44.1	149 19.2	08.2	322 01.3	50.9	125 47.2	09.7	146 48.3	19.0
20	230 46.6	164 18.8	08.7	337 04.1	50.9	140 49.0	09.7	161 50.5	19.0
21	245 49.0	179 18.4	09.2	352 06.8	50.9	155 50.9	09.7	176 52.6	19.0
22	260 51.5	194 18.0	09.7	7 09.6	50.9	170 52.7	09.7	191 54.8	19.1
23	275 54.0	209 17.6	10.2	22 12.3	50.9	185 54.6	09.7	206 57.0	19.1
13 00	290 56.4	224 17.2	N19 10.8	37 15.1	S26 50.9	200 56.5	N23 09.7	221 59.2	N20 19.2
01	305 58.9	239 16.8	11.3	52 17.8	50.9	215 58.3	09.7	237 01.3	19.2
02	321 01.4	254 16.4	11.8	67 20.5	50.9	231 00.2	09.7	252 03.5	19.2
03	336 03.8	269 15.9	12.3	82 23.3	50.8	246 02.0	09.7	267 05.7	19.3
04	351 06.3	284 15.5	12.8	97 26.0	50.8	261 03.9	09.7	282 07.9	19.3
05	6 08.7	299 15.1	13.3	112 28.7	50.8	276 05.8	09.7	297 10.0	19.3
06	21 11.2	314 14.7	N19 13.8	127 31.4	S26 50.8	291 07.6	N23 09.7	312 12.2	N20 19.4
07	36 13.7	329 14.3	14.3	142 34.2	50.8	306 09.5	09.7	327 14.4	19.4
V 08	51 16.1	344 13.9	14.8	157 36.9	50.8	321 11.3	09.7	342 16.6	19.4
I 09	66 18.6	359 13.5	15.3	172 39.6	50.8	336 13.2	09.8	357 18.7	19.5
E 10	81 21.1	14 13.1	15.9	187 42.3	50.8	351 15.1	09.8	12 20.9	19.5
R 11	96 23.5	29 12.6	16.4	202 45.1	50.8	6 16.9	09.8	27 23.1	19.6
12	111 26.0	44 12.2	N19 16.9	217 47.8	S26 50.8	21 18.8	N23 09.8	42 25.3	N20 19.6
N 13	126 28.5	59 11.8	17.4	232 50.5	50.8	36 20.6	09.8	57 27.5	19.6
E 14	141 30.9	74 11.4	17.9	247 53.2	50.8	51 22.5	09.8	72 29.6	19.7
S 15	156 33.4	89 11.0	18.4	262 55.9	50.8	66 24.4	09.8	87 31.8	19.7
16	171 35.9	104 10.6	18.9	277 58.6	50.8	81 26.2	09.8	102 34.0	19.7
17	186 38.3	119 10.1	19.4	293 01.4	50.8	96 28.1	09.8	117 36.2	19.8
18	201 40.8	134 09.7	N19 19.9	308 04.1	S26 50.8	111 29.9	N23 09.8	132 38.3	N20 19.8
19	216 43.2	149 09.3	20.4	323 06.8	50.8	126 31.8	09.8	147 40.5	19.9
20	231 45.7	164 08.9	20.9	338 09.5	50.8	141 33.7	09.8	162 42.7	19.9
21	246 48.2	179 08.5	21.4	353 12.2	50.7	156 35.5	09.8	177 44.9	19.9
22	261 50.6	194 08.0	21.9	8 14.9	50.7	171 37.4	09.8	192 47.0	20.0
23	276 53.1	209 07.6	22.4	23 17.6	50.7	186 39.2	09.8	207 49.2	20.0
14 00	291 55.6	224 07.2	N19 22.9	38 20.3	S26 50.7	201 41.1	N23 09.8	222 51.4	N20 20.0
01	306 58.0	239 06.8	23.4	53 23.0	50.7	216 43.0	09.8	237 53.6	20.1
02	322 00.5	254 06.3	23.9	68 25.7	50.7	231 44.8	09.8	252 55.8	20.1
03	337 03.0	269 05.9	24.4	83 28.4	50.7	246 46.7	09.8	267 57.9	20.1
04	352 05.4	284 05.5	24.9	98 31.1	50.7	261 48.6	09.8	283 00.1	20.2
05	7 07.9	299 05.1	25.4	113 33.8	50.7	276 50.4	09.8	298 02.3	20.2
06	22 10.4	314 04.6	N19 25.8	128 36.4	S26 50.7	291 52.3	N23 09.8	313 04.5	N20 20.3
07	37 12.8	329 04.2	26.3	143 39.1	50.7	306 54.1	09.8	328 06.7	20.3
S 08	52 15.3	344 03.8	26.8	158 41.8	50.7	321 56.0	09.8	343 08.8	20.3
A 09	67 17.7	359 03.4	27.3	173 44.5	50.7	336 57.9	09.8	358 11.0	20.4
B 10	82 20.2	14 02.9	27.8	188 47.2	50.7	351 59.7	09.8	13 13.2	20.4
A 11	97 22.7	29 02.5	28.3	203 49.9	50.7	7 01.6	09.8	28 15.4	20.4
12	112 25.1	44 02.1	N19 28.8	218 52.5	S26 50.7	22 03.4	N23 09.8	43 17.5	N20 20.5
D 13	127 27.6	59 01.6	29.3	233 55.2	50.7	37 05.3	09.8	58 19.7	20.5
O 14	142 30.1	74 01.2	29.8	248 57.9	50.7	52 07.2	09.8	73 21.9	20.5
15	157 32.5	89 00.8	30.3	264 00.6	50.7	67 09.0	09.8	88 24.1	20.6
16	172 35.0	104 00.3	30.7	279 03.2	50.6	82 10.9	09.8	103 26.3	20.6
17	187 37.5	118 59.9	31.2	294 05.9	50.6	97 12.8	09.8	118 28.4	20.6
18	202 39.9	133 59.5	N19 31.7	309 08.6	S26 50.6	112 14.6	N23 09.8	133 30.6	N20 20.7
19	217 42.4	148 59.0	32.2	324 11.3	50.6	127 16.5	09.8	148 32.8	20.7
20	232 44.8	163 58.6	32.7	339 13.9	50.6	142 18.3	09.8	163 35.0	20.8
21	247 47.3	178 58.2	33.2	354 16.6	50.6	157 20.2	09.8	178 37.2	20.8
22	262 49.8	193 57.7	33.6	9 19.3	50.6	172 22.1	09.8	193 39.3	20.8
23	277 52.2	208 57.3	34.1	24 21.9	50.6	187 23.9	09.8	208 41.5	20.9
	h m								
Pas. Mer.	4 35.5	*v* −0.4	*d* 0.5	*v* 2.7	*d* 0.0	*v* 1.9	*d* 0.0	*v* 2.2	*d* 0.0

ESTRELLAS

Nombre	A.H.S.	Dec.
	° ′	° ′
Acamar	315 25.6	S40 17.8
Achernar	335 33.7	S57 13.5
Acrux	173 20.1	S63 06.6
Adhara	255 20.3	S28 58.4
Aldebaran	291 00.4	N16 30.7
Alioth	166 28.9	N55 57.5
Alkaid	153 06.1	N49 18.7
Al Na'ir	27 55.0	S46 57.1
Alnilam	275 56.2	S 1 12.0
Alphard	218 05.6	S 8 39.8
Alphecca	126 18.7	N26 42.8
Alpheratz	357 53.1	N29 05.7
Altair	62 17.0	N 8 52.4
Ankaa	353 24.8	S42 17.7
Antares	112 37.5	S26 26.1
Arcturus	146 04.2	N19 10.7
Atria	107 47.4	S69 01.9
Avior	234 22.5	S59 30.9
Bellatrix	278 42.4	N 6 21.1
Betelgeuse	271 11.8	N 7 24.4
Canopus	264 00.9	S52 41.7
Capella	280 48.7	N45 59.8
Deneb	49 37.5	N45 17.0
Denebola	182 43.3	N14 34.0
Diphda	349 05.2	S17 58.7
Dubhe	194 03.4	N61 44.9
Elnath	278 24.8	N28 36.4
Eltanin	90 50.0	N51 29.5
Enif	33 56.0	N 9 52.9
Fomalhaut	15 34.0	S29 36.8
Gacrux	172 11.6	S57 07.4
Gienah	176 02.1	S17 33.0
Hadar	149 01.2	S60 23.0
Hamal	328 11.4	N23 28.0
Kaus Aust.	83 55.8	S34 23.0
Kochab	137 19.0	N74 09.4
Markab	13 47.5	N15 12.7
Menkar	314 25.0	N 4 05.7
Menkent	148 18.6	S36 22.7
Miaplacidus	221 42.6	S69 43.5
Mirfak	308 54.1	N49 51.7
Nunki	76 09.5	S26 17.7
Peacock	53 33.3	S56 43.7
Pollux	243 39.5	N28 01.4
Procyon	245 09.9	N 5 13.3
Rasalhague	96 14.8	N12 33.7
Regulus	207 53.7	N11 57.8
Rigel	281 21.4	S 8 12.0
Rigil Kent.	140 04.5	S60 50.6
Sabik	102 23.0	S15 43.6
Schedar	349 51.2	N56 32.4
Shaula	96 34.3	S37 06.3
Sirius	258 42.4	S16 43.0
Spica	158 41.1	S11 10.1
Suhail	222 59.8	S43 26.3
Vega	80 44.9	N38 47.2
Zuben'ubi	137 15.7	S16 02.8

	A.H.S.	Pas. Mer.
	° ′	h m
Venus	293 20.7	9 03
Marte	106 18.6	21 27
Júpiter	270 00.0	10 35
Saturno	291 02.7	9 11

T.U.	SOL				LUNA						
	A.H.G.		Dec.		A.H.G.	v		Dec.		d	P.H.
d h	°	′	°	′	°	′	′	°	′	′	′
JUEVES 12 00	178	36.7	N21	59.3	288	08.5	15.8	S 4	55.2	11.7	54.5
01	193	36.6		59.0	302	43.3	15.8	4	43.5	11.7	54.5
02	208	36.6		58.7	317	18.1	15.8	4	31.8	11.7	54.5
03	223	36.5	. .	58.3	331	52.9	15.8	4	20.1	11.7	54.6
04	238	36.4		58.0	346	27.7	15.8	4	08.4	11.8	54.6
05	253	36.3		57.6	1	02.5	15.8	3	56.6	11.8	54.6
06	268	36.2	N21	57.3	15	37.3	15.8	S 3	44.8	11.8	54.6
07	283	36.2		56.9	30	12.1	15.8	3	33.0	11.8	54.6
08	298	36.1		56.6	44	46.9	15.8	3	21.2	11.9	54.7
09	313	36.0	. .	56.2	59	21.7	15.7	3	09.3	11.8	54.7
10	328	35.9		55.9	73	56.4	15.8	2	57.5	11.9	54.7
11	343	35.9		55.5	88	31.2	15.8	2	45.6	11.9	54.7
12	358	35.8	N21	55.2	103	06.0	15.7	S 2	33.7	12.0	54.7
13	13	35.7		54.8	117	40.7	15.8	2	21.7	11.9	54.7
14	28	35.6		54.5	132	15.5	15.7	2	09.8	12.0	54.8
15	43	35.5	. .	54.1	146	50.2	15.7	1	57.8	11.9	54.8
16	58	35.5		53.7	161	24.9	15.7	1	45.9	12.0	54.8
17	73	35.4		53.4	175	59.6	15.7	1	33.9	12.0	54.8
18	88	35.3	N21	53.0	190	34.3	15.7	S 1	21.9	12.0	54.8
19	103	35.2		52.7	205	09.0	15.7	1	09.9	12.1	54.9
20	118	35.2		52.3	219	43.7	15.6	0	57.8	12.0	54.9
21	133	35.1	. .	52.0	234	18.3	15.6	0	45.8	12.1	54.9
22	148	35.0		51.6	248	52.9	15.7	0	33.7	12.0	54.9
23	163	34.9		51.2	263	27.6	15.5	0	21.7	12.1	54.9
VIERNES 13 00	178	34.9	N21	50.9	278	02.1	15.6	S 0	09.6	12.1	55.0
01	193	34.8		50.5	292	36.7	15.6	N 0	02.5	12.1	55.0
02	208	34.7		50.2	307	11.3	15.5	0	14.6	12.1	55.0
03	223	34.6	. .	49.8	321	45.8	15.5	0	26.7	12.1	55.0
04	238	34.6		49.4	336	20.3	15.4	0	38.8	12.1	55.1
05	253	34.5		49.1	350	54.7	15.5	0	50.9	12.1	55.1
06	268	34.4	N21	48.7	5	29.2	15.4	N 1	03.0	12.2	55.1
07	283	34.3		48.3	20	03.6	15.4	1	15.2	12.1	55.1
08	298	34.3		48.0	34	38.0	15.4	1	27.3	12.2	55.2
09	313	34.2	. .	47.6	49	12.4	15.3	1	39.5	12.1	55.2
10	328	34.1		47.2	63	46.7	15.3	1	51.6	12.2	55.2
11	343	34.0		46.9	78	21.0	15.2	2	03.8	12.1	55.2
12	358	34.0	N21	46.5	92	55.2	15.3	N 2	15.9	12.2	55.3
13	13	33.9		46.1	107	29.5	15.2	2	28.1	12.1	55.3
14	28	33.8		45.8	122	03.7	15.1	2	40.2	12.2	55.3
15	43	33.8	. .	45.4	136	37.8	15.2	2	52.4	12.1	55.3
16	58	33.7		45.0	151	12.0	15.0	3	04.5	12.2	55.4
17	73	33.6		44.7	165	46.0	15.1	3	16.7	12.1	55.4
18	88	33.5	N21	44.3	180	20.1	15.0	N 3	28.8	12.2	55.4
19	103	33.5		43.9	194	54.1	15.0	3	41.0	12.1	55.4
20	118	33.4		43.5	209	28.1	14.9	3	53.1	12.2	55.5
21	133	33.3	. .	43.2	224	02.0	14.9	4	05.3	12.1	55.5
22	148	33.3		42.8	238	35.9	14.8	4	17.4	12.2	55.5
23	163	33.2		42.4	253	09.7	14.8	4	29.6	12.1	55.5
SABADO 14 00	178	33.1	N21	42.0	267	43.5	14.8	N 4	41.7	12.1	55.6
01	193	33.0		41.7	282	17.3	14.7	4	53.8	12.1	55.6
02	208	33.0		41.3	296	51.0	14.6	5	05.9	12.1	55.6
03	223	32.9	. .	40.9	311	24.6	14.6	5	18.0	12.1	55.7
04	238	32.8		40.5	325	58.2	14.6	5	30.1	12.1	55.7
05	253	32.8		40.1	340	31.8	14.5	5	42.2	12.1	55.7
06	268	32.7	N21	39.8	355	05.3	14.4	N 5	54.3	12.0	55.8
07	283	32.6		39.4	9	38.7	14.4	6	06.3	12.1	55.8
08	298	32.6		39.0	24	12.1	14.3	6	18.4	12.0	55.8
09	313	32.5	. .	38.6	38	45.4	14.3	6	30.4	12.1	55.8
10	328	32.4		38.2	53	18.7	14.2	6	42.5	12.0	55.9
11	343	32.4		37.9	67	51.9	14.2	6	54.5	12.0	55.9
12	358	32.3	N21	37.5	82	25.1	14.1	N 7	06.5	11.9	55.9
13	13	32.2		37.1	96	58.2	14.1	7	18.4	12.0	56.0
14	28	32.2		36.7	111	31.3	14.0	7	30.4	11.9	56.0
15	43	32.1	. .	36.3	126	04.3	13.9	7	42.3	11.9	56.0
16	58	32.0		35.9	140	37.2	13.8	7	54.2	11.9	56.1
17	73	32.0		35.5	155	10.0	13.8	8	06.1	11.9	56.1
18	88	31.9	N21	35.2	169	42.8	13.8	N 8	18.0	11.9	56.1
19	103	31.8		34.8	184	15.6	13.6	8	29.9	11.8	56.2
20	118	31.8		34.4	198	48.2	13.6	8	41.7	11.8	56.2
21	133	31.7	. .	34.0	213	20.8	13.6	8	53.5	11.8	56.2
22	148	31.6		33.6	227	53.4	13.4	9	05.3	11.7	56.3
23	163	31.6		33.2	242	25.8	13.4	N 9	17.0	11.7	56.3
	SD	15.8	d	0.4	SD	14.9		15.1			15.2

Lat.	Crepúsculo Náutico	Crepúsculo Civil	Orto Sol	Orto Luna 12	Orto Luna 13	Orto Luna 14	Orto Luna 15
°	h m	h m	h m	h m	h m	h m	h m
N 72	▭	▭	▭	23 31	23 13	22 51	22 23
N 70	▭	▭	▭	23 31	23 19	23 05	22 48
68	▭	▭	▭	23 31	23 24	23 16	23 08
66	////	////	01 26	23 30	23 28	23 25	23 23
64	////	////	02 10	23 30	23 31	23 33	23 36
62	////	00 31	02 38	23 30	23 34	23 40	23 47
60	////	01 38	03 00	23 30	23 37	23 46	23 57
N 58	////	02 11	03 17	23 29	23 40	23 51	24 05
56	00 29	02 35	03 32	23 29	23 42	23 56	24 12
54	01 30	02 54	03 44	23 29	23 44	24 00	00 00
52	02 01	03 09	03 55	23 29	23 45	24 04	00 04
50	02 23	03 23	04 05	23 29	23 47	24 07	00 07
45	03 02	03 50	04 26	23 29	23 51	24 15	00 15
N 40	03 30	04 10	04 42	23 28	23 54	24 21	00 21
35	03 51	04 27	04 56	23 28	23 56	24 26	00 26
30	04 08	04 41	05 08	23 28	23 59	24 31	00 31
20	04 35	05 04	05 28	23 28	24 03	00 03	00 40
N 10	04 56	05 23	05 46	23 28	24 06	00 06	00 47
0	05 14	05 40	06 02	23 27	24 10	00 10	00 54
S 10	05 30	05 56	06 18	23 27	24 13	00 13	01 01
20	05 44	06 12	06 35	23 27	24 17	00 17	01 09
30	05 59	06 29	06 55	23 27	24 21	00 21	01 18
35	06 07	06 39	07 06	23 27	24 24	00 24	01 23
40	06 16	06 49	07 19	23 27	24 27	00 27	01 29
45	06 25	07 01	07 35	23 26	24 30	00 30	01 35
S 50	06 35	07 16	07 53	23 26	24 34	00 34	01 44
52	06 40	07 23	08 02	23 26	24 36	00 36	01 47
54	06 45	07 30	08 12	23 26	24 38	00 38	01 52
56	06 50	07 38	08 23	23 26	24 40	00 40	01 56
58	06 56	07 47	08 36	23 26	24 42	00 42	02 01
S 60	07 02	07 57	08 51	23 26	24 45	00 45	02 07

Lat.	Ocaso Sol	Crepúsculo Civil	Crepúsculo Náutico	Ocaso Luna 12	Ocaso Luna 13	Ocaso Luna 14	Ocaso Luna 15
°	h m	h m	h m	h m	h m	h m	h m
N 72	▭	▭	▭	10 28	12 16	14 09	16 14
N 70	▭	▭	▭	10 33	12 13	13 57	15 50
68	▭	▭	▭	10 36	12 10	13 48	15 32
66	22 41	////	////	10 39	12 08	13 40	15 18
64	22 00	////	////	10 41	12 06	13 34	15 06
62	21 32	23 31	////	10 43	12 05	13 29	14 56
60	21 10	22 30	////	10 45	12 03	13 24	14 48
N 58	20 53	21 58	////	10 47	12 02	13 20	14 40
56	20 39	21 35	23 34	10 48	12 01	13 16	14 34
54	20 26	21 17	22 39	10 50	12 00	13 13	14 28
52	20 15	21 01	22 09	10 51	11 59	13 10	14 23
50	20 06	20 48	21 47	10 52	11 58	13 07	14 18
45	19 45	20 21	21 08	10 54	11 57	13 01	14 08
N 40	19 29	20 01	20 41	10 56	11 55	12 56	13 59
35	19 15	19 44	20 20	10 58	11 54	12 52	13 52
30	19 03	19 30	20 03	10 59	11 53	12 48	13 46
20	18 43	19 07	19 36	11 02	11 51	12 42	13 35
N 10	18 26	18 48	19 15	11 04	11 49	12 36	13 25
0	18 09	18 32	18 57	11 06	11 48	12 31	13 17
S 10	17 53	18 16	18 42	11 08	11 46	12 26	13 08
20	17 36	18 00	18 27	11 10	11 44	12 20	12 58
30	17 17	17 43	18 12	11 12	11 42	12 14	12 48
35	17 05	17 33	18 04	11 13	11 41	12 10	12 41
40	16 52	17 22	17 56	11 15	11 40	12 06	12 34
45	16 37	17 10	17 47	11 17	11 38	12 01	12 26
S 50	16 19	16 56	17 37	11 19	11 37	11 55	12 16
52	16 10	16 49	17 32	11 20	11 36	11 53	12 12
54	16 00	16 42	17 27	11 21	11 35	11 50	12 07
56	15 49	16 34	17 22	11 22	11 34	11 47	12 02
58	15 36	16 25	17 16	11 23	11 33	11 43	11 56
S 60	15 21	16 15	17 09	11 24	11 32	11 39	11 49

Día	SOL E.T. (−) 00h	SOL E.T. (−) 12h	SOL Pas. Mer.	LUNA Pas. Mer. Sup.	LUNA Pas. Mer. Inf.	LUNA Edad	LUNA Fase
d	m s	m s	h m	h m	h m	d	%
12	05 33	05 37	12 06	04 56	17 16	21	63
13	05 40	05 44	12 06	05 37	17 59	22	53
14	05 47	05 51	12 06	06 20	18 42	23	43

T.U.	ARIES	VENUS −4.1		MARTE −1.9		JUPITER −1.9		SATURNO +0.2	
	A.H.G.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
15 00	292 54.7	223 56.9	N19 34.6	39 24.6	S26 50.6	202 25.8	N23 09.8	223 43.7	N20 20.9
01	307 57.2	238 56.4	35.1	54 27.2	50.6	217 27.7	09.8	238 45.9	20.9
02	322 59.6	253 56.0	35.6	69 29.9	50.6	232 29.5	09.8	253 48.1	21.0
03	338 02.1	268 55.6 . .	36.0	84 32.5 . .	50.6	247 31.4 . .	09.8	268 50.2 . .	21.0
04	353 04.6	283 55.1	36.5	99 35.2	50.6	262 33.3	09.8	283 52.4	21.0
05	8 07.0	298 54.7	37.0	114 37.9	50.6	277 35.1	09.8	298 54.6	21.1
06	23 09.5	313 54.2	N19 37.5	129 40.5	S26 50.6	292 37.0	N23 09.8	313 56.8	N20 21.1
07	38 12.0	328 53.8	38.0	144 43.2	50.6	307 38.8	09.8	328 59.0	21.1
D 08	53 14.4	343 53.4	38.4	159 45.8	50.6	322 40.7	09.9	344 01.1	21.2
O 09	68 16.9	358 52.9 . .	38.9	174 48.4 . .	50.6	337 42.6 . .	09.9	359 03.3 . .	21.2
M 10	83 19.3	13 52.5	39.4	189 51.1	50.6	352 44.4	09.9	14 05.5	21.3
I 11	98 21.8	28 52.0	39.9	204 53.7	50.5	7 46.3	09.9	29 07.7	21.3
N 12	113 24.3	43 51.6	N19 40.3	219 56.4	S26 50.5	22 48.2	N23 09.9	44 09.9	N20 21.3
G 13	128 26.7	58 51.1	40.8	234 59.0	50.5	37 50.0	09.9	59 12.1	21.4
O 14	143 29.2	73 50.7	41.3	250 01.7	50.5	52 51.9	09.9	74 14.2	21.4
15	158 31.7	88 50.3 . .	41.7	265 04.3 . .	50.5	67 53.8 . .	09.9	89 16.4 . .	21.4
16	173 34.1	103 49.8	42.2	280 06.9	50.5	82 55.6	09.9	104 18.6	21.5
17	188 36.6	118 49.4	42.7	295 09.6	50.5	97 57.5	09.9	119 20.8	21.5
18	203 39.1	133 48.9	N19 43.1	310 12.2	S26 50.5	112 59.3	N23 09.9	134 23.0	N20 21.5
19	218 41.5	148 48.5	43.6	325 14.8	50.5	128 01.2	09.9	149 25.1	21.6
20	233 44.0	163 48.0	44.1	340 17.4	50.5	143 03.1	09.9	164 27.3	21.6
21	248 46.5	178 47.6 . .	44.5	355 20.1 . .	50.5	158 04.9 . .	09.9	179 29.5 . .	21.6
22	263 48.9	193 47.1	45.0	10 22.7	50.5	173 06.8	09.9	194 31.7	21.7
23	278 51.4	208 46.7	45.5	25 25.3	50.5	188 08.7	09.9	209 33.9	21.7
16 00	293 53.8	223 46.2	N19 45.9	40 27.9	S26 50.5	203 10.5	N23 09.9	224 36.1	N20 21.8
01	308 56.3	238 45.8	46.4	55 30.6	50.5	218 12.4	09.9	239 38.2	21.8
02	323 58.8	253 45.3	46.9	70 33.2	50.5	233 14.3	09.9	254 40.4	21.8
03	339 01.2	268 44.9 . .	47.3	85 35.8 . .	50.5	248 16.1 . .	09.9	269 42.6 . .	21.9
04	354 03.7	283 44.4	47.8	100 38.4	50.5	263 18.0	09.9	284 44.8	21.9
05	9 06.2	298 44.0	48.3	115 41.0	50.5	278 19.9	09.9	299 47.0	21.9
06	24 08.6	313 43.5	N19 48.7	130 43.6	S26 50.5	293 21.7	N23 09.9	314 49.2	N20 22.0
07	39 11.1	328 43.1	49.2	145 46.2	50.5	308 23.6	09.9	329 51.3	22.0
08	54 13.6	343 42.6	49.6	160 48.8	50.4	323 25.5	09.9	344 53.5	22.0
L 09	69 16.0	358 42.2 . .	50.1	175 51.5 . .	50.4	338 27.3 . .	09.9	359 55.7 . .	22.1
U 10	84 18.5	13 41.7	50.5	190 54.1	50.4	353 29.2	09.9	14 57.9	22.1
N 11	99 20.9	28 41.2	51.0	205 56.7	50.4	8 31.0	09.9	30 00.1	22.1
E 12	114 23.4	43 40.8	N19 51.5	220 59.3	S26 50.4	23 32.9	N23 09.9	45 02.3	N20 22.2
S 13	129 25.9	58 40.3	51.9	236 01.9	50.4	38 34.8	09.9	60 04.4	22.2
14	144 28.3	73 39.9	52.4	251 04.5	50.4	53 36.6	09.9	75 06.6	22.2
15	159 30.8	88 39.4 . .	52.8	266 07.1 . .	50.4	68 38.5 . .	09.9	90 08.8 . .	22.3
16	174 33.3	103 39.0	53.3	281 09.7	50.4	83 40.4	09.9	105 11.0	22.3
17	189 35.7	118 38.5	53.7	296 12.2	50.4	98 42.2	09.9	120 13.2	22.3
18	204 38.2	133 38.0	N19 54.2	311 14.8	S26 50.4	113 44.1	N23 09.9	135 15.4	N20 22.4
19	219 40.7	148 37.6	54.6	326 17.4	50.4	128 46.0	09.9	150 17.5	22.4
20	234 43.1	163 37.1	55.1	341 20.0	50.4	143 47.8	09.9	165 19.7	22.5
21	249 45.6	178 36.7 . .	55.5	356 22.6 . .	50.4	158 49.7 . .	09.9	180 21.9 . .	22.5
22	264 48.1	193 36.2	56.0	11 25.2	50.4	173 51.6	09.9	195 24.1	22.5
23	279 50.5	208 35.7	56.4	26 27.8	50.4	188 53.4	09.9	210 26.3	22.6
17 00	294 53.0	223 35.3	N19 56.9	41 30.4	S26 50.4	203 55.3	N23 09.9	225 28.5	N20 22.6
01	309 55.4	238 34.8	57.3	56 32.9	50.4	218 57.2	09.9	240 30.6	22.6
02	324 57.9	253 34.3	57.8	71 35.5	50.4	233 59.0	09.9	255 32.8	22.7
03	340 00.4	268 33.9 . .	58.2	86 38.1 . .	50.4	249 00.9 . .	09.9	270 35.0 . .	22.7
04	355 02.8	283 33.4	58.6	101 40.7	50.4	264 02.8	09.9	285 37.2	22.7
05	10 05.3	298 32.9	59.1	116 43.2	50.4	279 04.6	09.9	300 39.4	22.8
06	25 07.8	313 32.5	N19 59.5	131 45.8	S26 50.4	294 06.5	N23 09.9	315 41.6	N20 22.8
07	40 10.2	328 32.0	20 00.0	146 48.4	50.4	309 08.4	09.9	330 43.8	22.8
M 08	55 12.7	343 31.5	00.4	161 50.9	50.3	324 10.2	09.9	345 45.9	22.9
A 09	70 15.2	358 31.1 . .	00.8	176 53.5 . .	50.3	339 12.1 . .	09.9	0 48.1 . .	22.9
R 10	85 17.6	13 30.6	01.3	191 56.1	50.3	354 14.0	09.9	15 50.3	22.9
T 11	100 20.1	28 30.1	01.7	206 58.6	50.3	9 15.8	09.9	30 52.5	23.0
E 12	115 22.6	43 29.7	N20 02.2	222 01.2	S26 50.3	24 17.7	N23 09.9	45 54.7	N20 23.0
S 13	130 25.0	58 29.2	02.6	237 03.8	50.3	39 19.6	09.9	60 56.9	23.0
14	145 27.5	73 28.7	03.0	252 06.3	50.3	54 21.4	09.9	75 59.1	23.1
15	160 29.9	88 28.3 . .	03.5	267 08.9 . .	50.3	69 23.3 . .	09.9	91 01.2 . .	23.1
16	175 32.4	103 27.8	03.9	282 11.4	50.3	84 25.2	09.9	106 03.4	23.1
17	190 34.9	118 27.3	04.3	297 14.0	50.3	99 27.0	09.9	121 05.6	23.2
18	205 37.3	133 26.8	N20 04.8	312 16.5	S26 50.3	114 28.9	N23 09.9	136 07.8	N20 23.2
19	220 39.8	148 26.4	05.2	327 19.1	50.3	129 30.8	09.9	151 10.0	23.2
20	235 42.3	163 25.9	05.6	342 21.6	50.3	144 32.6	09.9	166 12.2	23.3
21	250 44.7	178 25.4 . .	06.1	357 24.2 . .	50.3	159 34.5 . .	09.9	181 14.4 . .	23.3
22	265 47.2	193 24.9	06.5	12 26.7	50.3	174 36.4	09.9	196 16.6	23.3
23	280 49.7	208 24.5	06.9	27 29.3	50.3	189 38.2	09.8	211 18.7	23.4
	h m								
Pas. Mer.	4 23.7	v −0.5	d 0.5	v 2.6	d 0.0	v 1.9	d 0.0	v 2.2	d 0.0

ESTRELLAS		
Nombre	A.H.S.	Dec.
	° ′	° ′
Acamar	315 25.6	S40 17.8
Achernar	335 33.7	S57 13.5
Acrux	173 20.1	S63 06.6
Adhara	255 20.3	S28 58.4
Aldebaran	291 00.4	N16 30.7
Alioth	166 28.9	N55 57.5
Alkaid	153 06.2	N49 18.7
Al Na'ir	27 55.0	S46 57.1
Alnilam	275 56.2	S 1 12.0
Alphard	218 05.6	S 8 39.8
Alphecca	126 18.7	N26 42.8
Alpheratz	357 53.1	N29 05.7
Altair	62 17.0	N 8 52.4
Ankaa	353 24.7	S42 17.7
Antares	112 37.5	S26 26.1
Arcturus	146 04.2	N19 10.7
Atria	107 47.4	S69 02.0
Avior	234 22.5	S59 30.9
Bellatrix	278 42.3	N 6 21.1
Betelgeuse	271 11.7	N 7 24.4
Canopus	264 00.8	S52 41.7
Capella	280 48.7	N45 59.8
Deneb	49 37.4	N45 17.1
Denebola	182 43.3	N14 34.0
Diphda	349 05.2	S17 58.7
Dubhe	194 03.4	N61 44.9
Elnath	278 24.8	N28 36.4
Eltanin	90 50.0	N51 29.5
Enif	33 56.0	N 9 52.9
Fomalhaut	15 34.0	S29 36.8
Gacrux	172 11.6	S57 07.4
Gienah	176 02.1	S17 33.0
Hadar	149 01.2	S60 23.0
Hamal	328 11.4	N23 28.0
Kaus Aust.	83 55.8	S34 23.0
Kochab	137 19.1	N74 09.4
Markab	13 47.5	N15 12.7
Menkar	314 25.0	N 4 05.7
Menkent	148 18.6	S36 22.7
Miaplacidus	221 42.6	S69 43.5
Mirfak	308 54.1	N49 51.7
Nunki	76 09.5	S26 17.7
Peacock	53 33.3	S56 43.8
Pollux	243 39.5	N28 01.4
Procyon	245 09.9	N 5 13.3
Rasalhague	96 14.8	N12 33.7
Regulus	207 53.7	N11 57.8
Rigel	281 21.3	S 8 12.0
Rigil Kent.	140 04.5	S60 50.6
Sabik	102 23.0	S15 43.6
Schedar	349 51.2	N56 32.4
Shaula	96 34.3	S37 06.3
Sirius	258 42.3	S16 43.0
Spica	158 41.1	S11 10.1
Suhail	222 59.8	S43 26.3
Vega	80 44.9	N38 47.2
Zuben'ubi	137 15.7	S16 02.8

	A.H.S.	Pas. Mer.
	° ′	h m
Venus	289 52.4	9 05
Marte	106 34.1	21 14
Júpiter	269 16.7	10 26
Saturno	290 42.2	9 00

T.U.	SOL A.H.G.	SOL Dec.	LUNA A.H.G.	LUNA v	LUNA Dec.	LUNA d	LUNA P.H.
d h	° ′	° ′	° ′	′	° ′	′	′
15 00	178 31.5	N21 32.8	256 58.2	13.3	N 9 28.7	11.7	56.3
01	193 31.4	32.4	271 30.5	13.3	9 40.4	11.7	56.4
02	208 31.4	32.0	286 02.8	13.1	9 52.1	11.6	56.4
03	223 31.3	31.6	300 34.9	13.1	10 03.7	11.6	56.4
04	238 31.2	31.2	315 07.0	13.1	10 15.3	11.6	56.5
05	253 31.2	30.9	329 39.1	12.9	10 26.9	11.6	56.5
06	268 31.1	N21 30.5	344 11.0	12.9	N10 38.5	11.5	56.5
07	283 31.0	30.1	358 42.9	12.8	10 50.0	11.4	56.6
08	298 31.0	29.7	13 14.7	12.7	11 01.4	11.5	56.6
09	313 30.9	29.3	27 46.4	12.6	11 12.9	11.4	56.6
10	328 30.9	28.9	42 18.0	12.5	11 24.3	11.3	56.7
11	343 30.8	28.5	56 49.5	12.5	11 35.6	11.3	56.7
12	358 30.7	N21 28.1	71 21.0	12.4	N11 46.9	11.3	56.8
13	13 30.7	27.7	85 52.4	12.3	11 58.2	11.2	56.8
14	28 30.6	27.3	100 23.7	12.2	12 09.4	11.2	56.8
15	43 30.5	26.9	114 54.9	12.1	12 20.6	11.2	56.9
16	58 30.5	26.5	129 26.0	12.0	12 31.8	11.1	56.9
17	73 30.4	26.1	143 57.0	12.0	12 42.9	11.0	56.9
18	88 30.4	N21 25.7	158 28.0	11.8	N12 53.9	11.0	57.0
19	103 30.3	25.3	172 58.8	11.8	13 04.9	11.0	57.0
20	118 30.2	24.9	187 29.6	11.7	13 15.9	10.9	57.0
21	133 30.2	24.5	202 00.3	11.6	13 26.8	10.8	57.1
22	148 30.1	24.0	216 30.9	11.4	13 37.6	10.8	57.1
23	163 30.0	23.6	231 01.3	11.4	13 48.4	10.8	57.2
16 00	178 30.0	N21 23.2	245 31.7	11.3	N13 59.2	10.7	57.2
01	193 29.9	22.8	260 02.0	11.2	14 09.9	10.6	57.2
02	208 29.9	22.4	274 32.2	11.2	14 20.5	10.6	57.3
03	223 29.8	22.0	289 02.4	11.0	14 31.1	10.5	57.3
04	238 29.7	21.6	303 32.4	10.9	14 41.6	10.5	57.3
05	253 29.7	21.2	318 02.3	10.8	14 52.1	10.3	57.4
06	268 29.6	N21 20.8	332 32.1	10.7	N15 02.4	10.4	57.4
07	283 29.6	20.4	347 01.8	10.7	15 12.8	10.2	57.5
08	298 29.5	20.0	1 31.5	10.5	15 23.0	10.2	57.5
09	313 29.5	19.5	16 01.0	10.4	15 33.2	10.2	57.5
10	328 29.4	19.1	30 30.4	10.3	15 43.4	10.0	57.6
11	343 29.3	18.7	44 59.7	10.2	15 53.4	10.0	57.6
12	358 29.3	N21 18.3	59 28.9	10.1	N16 03.4	9.9	57.7
13	13 29.2	17.9	73 58.0	10.1	16 13.3	9.9	57.7
14	28 29.2	17.5	88 27.1	9.9	16 23.2	9.8	57.7
15	43 29.1	17.1	102 56.0	9.8	16 33.0	9.7	57.8
16	58 29.1	16.6	117 24.8	9.7	16 42.7	9.6	57.8
17	73 29.0	16.2	131 53.5	9.5	16 52.3	9.5	57.9
18	88 28.9	N21 15.8	146 22.0	9.5	N17 01.8	9.5	57.9
19	103 28.9	15.4	160 50.5	9.4	17 11.3	9.3	57.9
20	118 28.8	15.0	175 18.9	9.3	17 20.6	9.3	58.0
21	133 28.8	14.6	189 47.2	9.2	17 29.9	9.2	58.0
22	148 28.7	14.1	204 15.4	9.0	17 39.1	9.2	58.0
23	163 28.7	13.7	218 43.4	9.0	17 48.3	9.0	58.1
17 00	178 28.6	N21 13.3	233 11.4	8.8	N17 57.3	9.0	58.1
01	193 28.6	12.9	247 39.2	8.7	18 06.3	8.8	58.2
02	208 28.5	12.4	262 06.9	8.7	18 15.1	8.8	58.2
03	223 28.4	12.0	276 34.6	8.5	18 23.9	8.6	58.2
04	238 28.4	11.6	291 02.1	8.4	18 32.5	8.6	58.3
05	253 28.3	11.2	305 29.5	8.3	18 41.1	8.5	58.3
06	268 28.3	N21 10.7	319 56.8	8.2	N18 49.6	8.4	58.4
07	283 28.2	10.3	334 24.0	8.1	18 58.0	8.2	58.4
08	298 28.2	09.9	348 51.1	8.0	19 06.2	8.2	58.4
09	313 28.1	09.5	3 18.1	7.8	19 14.4	8.1	58.5
10	328 28.1	09.0	17 44.9	7.8	19 22.5	8.0	58.5
11	343 28.0	08.6	32 11.7	7.7	19 30.5	7.8	58.6
12	358 28.0	N21 08.2	46 38.4	7.5	N19 38.3	7.8	58.6
13	13 27.9	07.7	61 04.9	7.4	19 46.1	7.6	58.6
14	28 27.9	07.3	75 31.3	7.4	19 53.7	7.6	58.7
15	43 27.8	06.9	89 57.7	7.2	20 01.3	7.4	58.7
16	58 27.8	06.5	104 23.9	7.1	20 08.7	7.3	58.7
17	73 27.7	06.0	118 50.0	7.0	20 16.0	7.2	58.8
18	88 27.7	N21 05.6	133 16.0	6.9	N20 23.2	7.1	58.8
19	103 27.6	05.2	147 41.9	6.8	20 30.3	6.9	58.9
20	118 27.6	04.7	162 07.7	6.7	20 37.2	6.9	58.9
21	133 27.5	04.3	176 33.4	6.6	20 44.1	6.7	58.9
22	148 27.5	03.9	190 59.0	6.4	20 50.8	6.6	59.0
23	163 27.4	03.4	205 24.4	6.4	N20 57.4	6.5	59.0
	SD 15.8	d 0.4	SD 15.5		15.7		16.0

Lat.	Crepúsculo Náutico	Crepúsculo Civil	Orto Sol	Orto Luna 15	Orto Luna 16	Orto Luna 17	Orto Luna 18
°	h m	h m	h m	h m	h m	h m	h m
N 72	▭	▭	▭	22 23	21 22	▭	▭
N 70	▭	▭	▭	22 48	22 22	▭	▭
68	▭	▭	▭	23 08	22 57	22 38	▭
66	////	////	01 40	23 23	23 23	23 24	23 34
64	////	////	02 18	23 36	23 42	23 54	24 20
62	////	00 57	02 45	23 47	23 59	24 17	00 17
60	////	01 48	03 05	23 57	24 12	00 12	00 36
N 58	////	02 18	03 22	24 05	00 05	00 24	00 51
56	00 52	02 41	03 36	24 12	00 12	00 34	01 04
54	01 39	02 59	03 48	00 00	00 19	00 43	01 16
52	02 07	03 14	03 59	00 04	00 25	00 51	01 26
50	02 28	03 27	04 09	00 07	00 30	00 59	01 35
45	03 06	03 53	04 28	00 15	00 42	01 14	01 54
N 40	03 33	04 13	04 44	00 21	00 51	01 27	02 10
35	03 54	04 29	04 58	00 26	01 00	01 38	02 24
30	04 10	04 43	05 10	00 31	01 07	01 48	02 35
20	04 37	05 05	05 29	00 40	01 20	02 05	02 55
N 10	04 57	05 24	05 47	00 47	01 31	02 19	03 13
0	05 14	05 40	06 02	00 54	01 42	02 33	03 29
S 10	05 30	05 56	06 18	01 01	01 52	02 47	03 46
20	05 44	06 11	06 35	01 09	02 04	03 02	04 04
30	05 59	06 28	06 54	01 18	02 17	03 20	04 24
35	06 06	06 37	07 05	01 23	02 25	03 30	04 36
40	06 14	06 48	07 18	01 29	02 34	03 41	04 50
45	06 23	07 00	07 33	01 35	02 44	03 55	05 07
S 50	06 33	07 14	07 51	01 44	02 56	04 12	05 27
52	06 38	07 20	07 59	01 47	03 02	04 20	05 37
54	06 42	07 27	08 09	01 52	03 09	04 28	05 48
56	06 48	07 35	08 20	01 56	03 16	04 38	06 01
58	06 53	07 44	08 32	02 01	03 24	04 50	06 15
S 60	06 59	07 54	08 47	02 07	03 34	05 03	06 32

Lat.	Ocaso Sol	Crepúsculo Civil	Crepúsculo Náutico	Ocaso Luna 15	Ocaso Luna 16	Ocaso Luna 17	Ocaso Luna 18
°	h m	h m	h m	h m	h m	h m	h m
N 72	▭	▭	▭	16 14	18 59	▭	▭
N 70	▭	▭	▭	15 50	18 01	▭	▭
68	▭	▭	▭	15 32	17 27	19 40	▭
66	22 29	////	////	15 18	17 02	18 54	20 48
64	21 51	////	////	15 06	16 43	18 25	20 02
62	21 25	23 09	////	14 56	16 28	18 03	19 32
60	21 05	22 21	////	14 48	16 15	17 45	19 10
N 58	20 49	21 52	////	14 40	16 04	17 30	18 52
56	20 35	21 30	23 14	14 34	15 55	17 17	18 36
54	20 23	21 12	22 30	14 28	15 46	17 06	18 23
52	20 12	20 57	22 03	14 23	15 39	16 56	18 11
50	20 03	20 45	21 43	14 18	15 32	16 47	18 01
45	19 43	20 19	21 05	14 08	15 17	16 29	17 40
N 40	19 27	19 59	20 39	13 59	15 06	16 14	17 23
35	19 14	19 43	20 18	13 52	14 55	16 01	17 08
30	19 02	19 29	20 01	13 46	14 47	15 50	16 55
20	18 42	19 07	19 35	13 35	14 31	15 31	16 34
N 10	18 25	18 48	19 15	13 25	14 18	15 15	16 15
0	18 10	18 32	18 58	13 17	14 06	15 00	15 58
S 10	17 54	18 16	18 42	13 08	13 54	14 44	15 40
20	17 37	18 01	18 28	12 58	13 40	14 28	15 22
30	17 18	17 44	18 14	12 48	13 26	14 09	15 00
35	17 07	17 35	18 06	12 41	13 17	13 58	14 48
40	16 55	17 25	17 58	12 34	13 07	13 46	14 33
45	16 40	17 13	17 49	12 26	12 56	13 31	14 16
S 50	16 22	16 59	17 39	12 16	12 42	13 14	13 55
52	16 13	16 52	17 35	12 12	12 35	13 05	13 45
54	16 04	16 45	17 30	12 07	12 28	12 56	13 34
56	15 53	16 38	17 25	12 02	12 20	12 45	13 21
58	15 40	16 29	17 19	11 56	12 11	12 33	13 06
S 60	15 26	16 19	17 13	11 49	12 01	12 19	12 48

Día	SOL E.T. (−) 00h	SOL E.T. (−) 12h	SOL Pas. Mer.	LUNA Pas. Mer. Sup.	LUNA Mer. Inf.	LUNA Edad	LUNA Fase
d	m s	m s	h m	h m	h m	d	%
15	05 54	05 57	12 06	07 05	19 29	24	33
16	06 00	06 03	12 06	07 54	20 19	25	23
17	06 05	06 08	12 06	08 46	21 14	26	15

T.U.	ARIES	VENUS −4.1		MARTE −1.8		JUPITER −1.9		SATURNO +0.2	
	A.H.G.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
18 00	295 52.1	223 24.0	N20 07.4	42 31.8	S26 50.3	204 40.1	N23 09.8	226 20.9	N20 23.4
01	310 54.6	238 23.5	07.8	57 34.4	50.3	219 42.0	09.8	241 23.1	23.4
02	325 57.1	253 23.0	08.2	72 36.9	50.3	234 43.9	09.8	256 25.3	23.5
03	340 59.5	268 22.6 . .	08.6	87 39.4 . .	50.3	249 45.7 . .	09.8	271 27.5 . .	23.5
04	356 02.0	283 22.1	09.1	102 42.0	50.3	264 47.6	09.8	286 29.7	23.6
05	11 04.4	298 21.6	09.5	117 44.5	50.3	279 49.5	09.8	301 31.9	23.6
06	26 06.9	313 21.1	N20 09.9	132 47.0	S26 50.3	294 51.3	N23 09.8	316 34.0	N20 23.6
M 07	41 09.4	328 20.6	10.3	147 49.6	50.3	309 53.2	09.8	331 36.2	23.7
I 08	56 11.8	343 20.2	10.8	162 52.1	50.3	324 55.1	09.8	346 38.4	23.7
E 09	71 14.3	358 19.7 . .	11.2	177 54.6 . .	50.3	339 56.9 . .	09.8	1 40.6 . .	23.7
R 10	86 16.8	13 19.2	11.6	192 57.2	50.3	354 58.8	09.8	16 42.8	23.8
C 11	101 19.2	28 18.7	12.0	207 59.7	50.3	10 00.7	09.8	31 45.0	23.8
O 12	116 21.7	43 18.2	N20 12.4	223 02.2	S26 50.3	25 02.5	N23 09.8	46 47.2	N20 23.8
L 13	131 24.2	58 17.8	12.9	238 04.7	50.3	40 04.4	09.8	61 49.4	23.9
E 14	146 26.6	73 17.3	13.3	253 07.2	50.3	55 06.3	09.8	76 51.6	23.9
S 15	161 29.1	88 16.8 . .	13.7	268 09.8 . .	50.2	70 08.1 . .	09.8	91 53.7 . .	23.9
16	176 31.6	103 16.3	14.1	283 12.3	50.2	85 10.0	09.8	106 55.9	24.0
17	191 34.0	118 15.8	14.5	298 14.8	50.2	100 11.9	09.8	121 58.1	24.0
18	206 36.5	133 15.3	N20 15.0	313 17.3	S26 50.2	115 13.8	N23 09.8	137 00.3	N20 24.0
19	221 38.9	148 14.8	15.4	328 19.8	50.2	130 15.6	09.8	152 02.5	24.1
20	236 41.4	163 14.4	15.8	343 22.3	50.2	145 17.5	09.8	167 04.7	24.1
21	251 43.9	178 13.9 . .	16.2	358 24.8 . .	50.2	160 19.4 . .	09.8	182 06.9 . .	24.1
22	266 46.3	193 13.4	16.6	13 27.3	50.2	175 21.2	09.8	197 09.1	24.2
23	281 48.8	208 12.9	17.0	28 29.8	50.2	190 23.1	09.8	212 11.3	24.2
19 00	296 51.3	223 12.4	N20 17.4	43 32.3	S26 50.2	205 25.0	N23 09.8	227 13.4	N20 24.2
01	311 53.7	238 11.9	17.8	58 34.8	50.2	220 26.8	09.8	242 15.6	24.3
02	326 56.2	253 11.4	18.2	73 37.3	50.2	235 28.7	09.8	257 17.8	24.3
03	341 58.7	268 10.9 . .	18.7	88 39.8 . .	50.2	250 30.6 . .	09.8	272 20.0 . .	24.3
04	357 01.1	283 10.5	19.1	103 42.3	50.2	265 32.5	09.8	287 22.2	24.4
05	12 03.6	298 10.0	19.5	118 44.8	50.2	280 34.3	09.8	302 24.4	24.4
06	27 06.1	313 09.5	N20 19.9	133 47.3	S26 50.2	295 36.2	N23 09.8	317 26.6	N20 24.4
J 07	42 08.5	328 09.0	20.3	148 49.8	50.2	310 38.1	09.8	332 28.8	24.5
U 08	57 11.0	343 08.5	20.7	163 52.3	50.2	325 39.9	09.8	347 31.0	24.5
E 09	72 13.4	358 08.0 . .	21.1	178 54.8 . .	50.2	340 41.8 . .	09.8	2 33.2 . .	24.5
V 10	87 15.9	13 07.5	21.5	193 57.3	50.2	355 43.7	09.8	17 35.3	24.6
E 11	102 18.4	28 07.0	21.9	208 59.8	50.2	10 45.5	09.8	32 37.5	24.6
S 12	117 20.8	43 06.5	N20 22.3	224 02.2	S26 50.2	25 47.4	N23 09.8	47 39.7	N20 24.6
13	132 23.3	58 06.0	22.7	239 04.7	50.2	40 49.3	09.8	62 41.9	24.7
14	147 25.8	73 05.5	23.1	254 07.2	50.2	55 51.2	09.8	77 44.1	24.7
15	162 28.2	88 05.0 . .	23.5	269 09.7 . .	50.2	70 53.0 . .	09.8	92 46.3 . .	24.7
16	177 30.7	103 04.5	23.9	284 12.2	50.2	85 54.9	09.8	107 48.5	24.8
17	192 33.2	118 04.0	24.3	299 14.6	50.2	100 56.8	09.8	122 50.7	24.8
18	207 35.6	133 03.5	N20 24.7	314 17.1	S26 50.2	115 58.6	N23 09.8	137 52.9	N20 24.8
19	222 38.1	148 03.0	25.1	329 19.6	50.2	131 00.5	09.8	152 55.1	24.9
20	237 40.5	163 02.5	25.5	344 22.0	50.2	146 02.4	09.8	167 57.3	24.9
21	252 43.0	178 02.0 . .	25.9	359 24.5 . .	50.2	161 04.3 . .	09.8	182 59.4 . .	24.9
22	267 45.5	193 01.5	26.3	14 27.0	50.2	176 06.1	09.8	198 01.6	25.0
23	282 47.9	208 01.0	26.7	29 29.4	50.2	191 08.0	09.7	213 03.8	25.0
20 00	297 50.4	223 00.5	N20 27.0	44 31.9	S26 50.2	206 09.9	N23 09.7	228 06.0	N20 25.0
01	312 52.9	238 00.0	27.4	59 34.4	50.2	221 11.7	09.7	243 08.2	25.1
02	327 55.3	252 59.5	27.8	74 36.8	50.2	236 13.6	09.7	258 10.4	25.1
03	342 57.8	267 59.0 . .	28.2	89 39.3 . .	50.2	251 15.5 . .	09.7	273 12.6 . .	25.1
04	358 00.3	282 58.5	28.6	104 41.7	50.2	266 17.4	09.7	288 14.8	25.2
05	13 02.7	297 58.0	29.0	119 44.2	50.2	281 19.2	09.7	303 17.0	25.2
06	28 05.2	312 57.5	N20 29.4	134 46.6	S26 50.2	296 21.1	N23 09.7	318 19.2	N20 25.2
07	43 07.7	327 57.0	29.8	149 49.1	50.2	311 23.0	09.7	333 21.4	25.3
V 08	58 10.1	342 56.5	30.2	164 51.5	50.2	326 24.9	09.7	348 23.6	25.3
I 09	73 12.6	357 56.0 . .	30.5	179 54.0 . .	50.2	341 26.7 . .	09.7	3 25.8 . .	25.3
E 10	88 15.0	12 55.5	30.9	194 56.4	50.2	356 28.6	09.7	18 27.9	25.3
R 11	103 17.5	27 55.0	31.3	209 58.9	50.2	11 30.5	09.7	33 30.1	25.4
N 12	118 20.0	42 54.5	N20 31.7	225 01.3	S26 50.2	26 32.3	N23 09.7	48 32.3	N20 25.4
E 13	133 22.4	57 54.0	32.1	240 03.8	50.2	41 34.2	09.7	63 34.5	25.4
S 14	148 24.9	72 53.5	32.5	255 06.2	50.2	56 36.1	09.7	78 36.7	25.5
15	163 27.4	87 53.0 . .	32.8	270 08.6 . .	50.2	71 38.0 . .	09.7	93 38.9 . .	25.5
16	178 29.8	102 52.5	33.2	285 11.1	50.2	86 39.8	09.7	108 41.1	25.5
17	193 32.3	117 51.9	33.6	300 13.5	50.2	101 41.7	09.7	123 43.3	25.6
18	208 34.8	132 51.4	N20 34.0	315 16.0	S26 50.2	116 43.6	N23 09.7	138 45.5	N20 25.6
19	223 37.2	147 50.9	34.3	330 18.4	50.2	131 45.5	09.7	153 47.7	25.6
20	238 39.7	162 50.4	34.7	345 20.8	50.2	146 47.3	09.7	168 49.9	25.7
21	253 42.2	177 49.9 . .	35.1	0 23.2 . .	50.2	161 49.2 . .	09.7	183 52.1 . .	25.7
22	268 44.6	192 49.4	35.5	15 25.7	50.2	176 51.1	09.7	198 54.3	25.7
23	283 47.1	207 48.9	35.8	30 28.1	50.2	191 53.0	09.7	213 56.5	25.8
Pas. Mer.	h m 4 11.9	v −0.5	d 0.4	v 2.5	d 0.0	v 1.9	d 0.0	v 2.2	d 0.0

ESTRELLAS

Nombre	A.H.S. ° ′	Dec. ° ′
Acamar	315 25.5	S40 17.8
Achernar	335 33.6	S57 13.5
Acrux	173 20.1	S63 06.6
Adhara	255 20.3	S28 58.4
Aldebaran	291 00.4	N16 30.7
Alioth	166 28.9	N55 57.5
Alkaid	153 06.2	N49 18.7
Al Na'ir	27 55.0	S46 57.1
Alnilam	275 56.1	S 1 12.0
Alphard	218 05.6	S 8 39.8
Alphecca	126 18.7	N26 42.8
Alpheratz	357 53.1	N29 05.7
Altair	62 17.0	N 8 52.4
Ankaa	353 24.7	S42 17.7
Antares	112 37.5	S26 26.1
Arcturus	146 04.2	N19 10.7
Atria	107 47.4	S69 02.0
Avior	234 22.5	S59 30.9
Bellatrix	278 42.3	N 6 21.1
Betelgeuse	271 11.7	N 7 24.5
Canopus	264 00.8	S52 41.7
Capella	280 48.7	N45 59.8
Deneb	49 37.4	N45 17.1
Denebola	182 43.3	N14 34.0
Diphda	349 05.2	S17 58.6
Dubhe	194 03.4	N61 44.9
Elnath	278 24.8	N28 36.4
Eltanin	90 50.0	N51 29.5
Enif	33 56.0	N 9 52.9
Fomalhaut	15 34.0	S29 36.8
Gacrux	172 11.6	S57 07.4
Gienah	176 02.1	S17 33.0
Hadar	149 01.2	S60 23.0
Hamal	328 11.4	N23 28.0
Kaus Aust.	83 55.8	S34 23.0
Kochab	137 19.1	N74 09.4
Markab	13 47.4	N15 12.7
Menkar	314 25.0	N 4 05.7
Menkent	148 18.6	S36 22.7
Miaplacidus	221 42.7	S69 43.4
Mirfak	308 54.0	N49 51.7
Nunki	76 09.5	S26 17.7
Peacock	53 33.3	S56 43.8
Pollux	243 39.5	N28 01.4
Procyon	245 09.8	N 5 13.3
Rasalhague	96 14.8	N12 33.7
Regulus	207 53.7	N11 57.8
Rigel	281 21.3	S 8 11.9
Rigil Kent.	140 04.6	S60 50.6
Sabik	102 23.0	S15 43.6
Schedar	349 51.1	N56 32.4
Shaula	96 34.3	S37 06.3
Sirius	258 42.3	S16 43.0
Spica	158 41.2	S11 10.1
Suhail	222 59.8	S43 26.3
Vega	80 44.9	N38 47.2
Zuben'ubi	137 15.7	S16 02.8

	A.H.S. ° ′	Pas. Mer. h m
Venus	286 21.1	9 07
Marte	106 41.1	21 02
Júpiter	268 33.7	10 17
Saturno	290 22.2	8 50

T.U.	SOL				LUNA					
	A.H.G.		Dec.		A.H.G.	v	Dec.		d	P.H.
d h	°	′	°	′	°	′	°	′	′	′
18 00	178	27.4	N21	03.0	219	49.8	6.3	N21	03.9	6.3	59.1
01	193	27.3		02.5	234	15.1	6.2	21	10.2	6.2	59.1
02	208	27.3		02.1	248	40.3	6.0	21	16.4	6.1	59.1
03	223	27.2	. .	01.7	263	05.3	6.0	21	22.5	6.0	59.2
04	238	27.2		01.2	277	30.3	5.9	21	28.5	5.8	59.2
05	253	27.1		00.8	291	55.2	5.7	21	34.3	5.7	59.2
06	268	27.1	N21	00.3	306	19.9	5.7	N21	40.0	5.5	59.3
M 07	283	27.0	20	59.9	320	44.6	5.6	21	45.5	5.4	59.3
I 08	298	27.0		59.5	335	09.2	5.5	21	50.9	5.3	59.3
E 09	313	26.9	. .	59.0	349	33.7	5.4	21	56.2	5.2	59.4
R 10	328	26.9		58.6	3	58.1	5.3	22	01.4	5.0	59.4
C 11	343	26.8		58.1	18	22.4	5.2	22	06.4	4.8	59.5
O 12	358	26.8	N20	57.7	32	46.6	5.1	N22	11.2	4.7	59.5
L 13	13	26.7		57.2	47	10.7	5.0	22	15.9	4.6	59.5
E 14	28	26.7		56.8	61	34.7	4.9	22	20.5	4.4	59.6
S 15	43	26.6	. .	56.4	75	58.6	4.9	22	24.9	4.3	59.6
16	58	26.6		55.9	90	22.5	4.7	22	29.2	4.1	59.6
17	73	26.5		55.5	104	46.2	4.7	22	33.3	4.0	59.7
18	88	26.5	N20	55.0	119	09.9	4.6	N22	37.3	3.8	59.7
19	103	26.5		54.6	133	33.5	4.5	22	41.1	3.7	59.7
20	118	26.4		54.1	147	57.0	4.4	22	44.8	3.5	59.8
21	133	26.4	. .	53.7	162	20.4	4.4	22	48.3	3.4	59.8
22	148	26.3		53.2	176	43.8	4.2	22	51.7	3.2	59.8
23	163	26.3		52.8	191	07.0	4.2	22	54.9	3.1	59.9
19 00	178	26.2	N20	52.3	205	30.2	4.2	N22	58.0	2.9	59.9
01	193	26.2		51.9	219	53.4	4.0	23	00.9	2.7	59.9
02	208	26.1		51.4	234	16.4	4.0	23	03.6	2.6	60.0
03	223	26.1	. .	51.0	248	39.4	3.9	23	06.2	2.4	60.0
04	238	26.1		50.5	263	02.3	3.9	23	08.6	2.2	60.0
05	253	26.0		50.0	277	25.2	3.8	23	10.8	2.1	60.0
06	268	26.0	N20	49.6	291	48.0	3.7	N23	12.9	2.0	60.1
07	283	25.9		49.1	306	10.7	3.7	23	14.9	1.7	60.1
J 08	298	25.9		48.7	320	33.4	3.6	23	16.6	1.6	60.1
U 09	313	25.8	. .	48.2	334	56.0	3.6	23	18.2	1.4	60.2
E 10	328	25.8		47.8	349	18.6	3.5	23	19.6	1.3	60.2
11	343	25.8		47.3	3	41.1	3.4	23	20.9	1.1	60.2
V 12	358	25.7	N20	46.9	18	03.5	3.4	N23	22.0	0.9	60.2
E 13	13	25.7		46.4	32	25.9	3.4	23	22.9	0.8	60.3
S 14	28	25.6		45.9	46	48.3	3.3	23	23.7	0.5	60.3
15	43	25.6	. .	45.5	61	10.6	3.3	23	24.2	0.4	60.3
16	58	25.6		45.0	75	32.9	3.2	23	24.6	0.3	60.4
17	73	25.5		44.5	89	55.1	3.2	23	24.9	0.1	60.4
18	88	25.5	N20	44.1	104	17.3	3.2	N23	25.0	0.2	60.4
19	103	25.4		43.6	118	39.5	3.1	23	24.8	0.2	60.4
20	118	25.4		43.2	133	01.6	3.1	23	24.6	0.5	60.5
21	133	25.4	. .	42.7	147	23.7	3.1	23	24.1	0.6	60.5
22	148	25.3		42.2	161	45.8	3.1	23	23.5	0.8	60.5
23	163	25.3		41.8	176	07.9	3.0	23	22.7	1.0	60.5
20 00	178	25.2	N20	41.3	190	29.9	3.0	N23	21.7	1.1	60.6
01	193	25.2		40.8	204	51.9	3.0	23	20.6	1.3	60.6
02	208	25.2		40.4	219	13.9	2.9	23	19.3	1.5	60.6
03	223	25.1	. .	39.9	233	35.8	3.0	23	17.8	1.7	60.6
04	238	25.1		39.4	247	57.8	2.9	23	16.1	1.8	60.6
05	253	25.1		39.0	262	19.7	3.0	23	14.3	2.1	60.7
06	268	25.0	N20	38.5	276	41.7	2.9	N23	12.2	2.2	60.7
07	283	25.0		38.0	291	03.6	2.9	23	10.0	2.3	60.7
V 08	298	24.9		37.5	305	25.5	3.0	23	07.7	2.6	60.7
I 09	313	24.9	. .	37.1	319	47.5	2.9	23	05.1	2.7	60.7
E 10	328	24.9		36.6	334	09.4	2.9	23	02.4	2.9	60.8
R 11	343	24.8		36.1	348	31.3	3.0	22	59.5	3.0	60.8
N 12	358	24.8	N20	35.7	2	53.3	2.9	N22	56.5	3.3	60.8
E 13	13	24.8		35.2	17	15.2	3.0	22	53.2	3.4	60.8
S 14	28	24.7		34.7	31	37.2	2.9	22	49.8	3.6	60.8
15	43	24.7	. .	34.2	45	59.1	3.0	22	46.2	3.7	60.8
16	58	24.7		33.8	60	21.1	3.0	22	42.5	4.0	60.9
17	73	24.6		33.3	74	43.1	3.0	22	38.5	4.1	60.9
18	88	24.6	N20	32.8	89	05.1	3.1	N22	34.4	4.2	60.9
19	103	24.6		32.3	103	27.2	3.0	22	30.2	4.5	60.9
20	118	24.5		31.9	117	49.2	3.1	22	25.7	4.6	60.9
21	133	24.5	. .	31.4	132	11.3	3.2	22	21.1	4.8	60.9
22	148	24.5		30.9	146	33.5	3.1	22	16.3	4.9	60.9
23	163	24.4		30.4	160	55.6	3.2	N22	11.4	5.1	60.9
	SD	15.8	d	0.5	SD		16.2		16.4		16.6

Lat.	Crepúsculo Náutico	Crepúsculo Civil	Orto Sol	Orto Luna 18	Orto Luna 19	Orto Luna 20	Orto Luna 21
°	h m	h m	h m	h m	h m	h m	h m
N 72	▭	▭	▭	▭	▭	▭	▭
N 70	▭	▭	▭	▭	▭	▭	▭
68	////	////	00 46	▭	▭	▭	00 48
66	////	////	01 53	23 34	24 22	00 22	02 10
64	////	////	02 27	24 20	00 20	01 16	02 48
62	////	01 15	02 52	00 17	00 51	01 48	03 14
60	////	01 58	03 12	00 36	01 13	02 13	03 35
N 58	////	02 26	03 27	00 51	01 32	02 32	03 52
56	01 09	02 47	03 41	01 04	01 48	02 48	04 06
54	01 48	03 04	03 53	01 16	02 01	03 02	04 18
52	02 14	03 18	04 03	01 26	02 13	03 14	04 29
50	02 34	03 31	04 12	01 35	02 23	03 25	04 39
45	03 10	03 56	04 31	01 54	02 45	03 47	04 59
N 40	03 36	04 15	04 47	02 10	03 03	04 05	05 15
35	03 56	04 31	05 00	02 24	03 17	04 20	05 29
30	04 12	04 45	05 11	02 35	03 30	04 33	05 41
20	04 38	05 07	05 31	02 55	03 53	04 55	06 02
N 10	04 58	05 25	05 47	03 13	04 12	05 15	06 20
0	05 15	05 41	06 03	03 29	04 30	05 33	06 36
S 10	05 30	05 56	06 18	03 46	04 48	05 51	06 53
20	05 44	06 11	06 34	04 04	05 07	06 10	07 10
30	05 58	06 27	06 53	04 24	05 30	06 33	07 31
35	06 05	06 36	07 04	04 36	05 43	06 46	07 43
40	06 13	06 46	07 16	04 50	05 58	07 01	07 56
45	06 21	06 58	07 30	05 07	06 16	07 19	08 12
S 50	06 31	07 11	07 48	05 27	06 39	07 41	08 32
52	06 35	07 17	07 56	05 37	06 50	07 52	08 41
54	06 40	07 24	08 05	05 48	07 02	08 04	08 52
56	06 44	07 32	08 16	06 01	07 16	08 18	09 04
58	06 50	07 40	08 28	06 15	07 32	08 34	09 17
S 60	06 56	07 49	08 42	06 32	07 52	08 53	09 33

Lat.	Ocaso Sol	Crepúsculo Civil	Crepúsculo Náutico	Ocaso Luna 18	Ocaso Luna 19	Ocaso Luna 20	Ocaso Luna 21
°	h m	h m	h m	h m	h m	h m	h m
N 72	▭	▭	▭	▭	▭	▭	▭
N 70	▭	▭	▭	▭	▭	▭	▭
68	23 16	////	////	▭	▭	▭	{ 00 00 / 23 15 }
66	22 16	////	////	20 48	22 11	22 37	22 42
64	21 43	////	////	20 02	21 18	21 59	22 18
62	21 19	22 52	////	19 32	20 45	21 32	21 59
60	21 00	22 12	////	19 10	20 21	21 11	21 43
N 58	20 44	21 45	////	18 52	20 01	20 54	21 30
56	20 31	21 24	22 59	18 36	19 45	20 39	21 18
54	20 19	21 07	22 22	18 23	19 31	20 27	21 08
52	20 09	20 53	21 57	18 11	19 19	20 15	20 59
50	20 00	20 41	21 37	18 01	19 09	20 05	20 51
45	19 41	20 16	21 02	17 40	18 46	19 45	20 33
N 40	19 25	19 57	20 36	17 23	18 28	19 28	20 19
35	19 12	19 41	20 16	17 08	18 13	19 13	20 06
30	19 01	19 28	20 00	16 55	18 00	19 01	19 56
20	18 42	19 06	19 34	16 34	17 37	18 39	19 37
N 10	18 25	18 48	19 14	16 15	17 18	18 21	19 21
0	18 10	18 32	18 58	15 58	17 00	18 03	19 06
S 10	17 55	18 17	18 43	15 40	16 41	17 45	18 50
20	17 38	18 02	18 29	15 22	16 22	17 27	18 34
30	17 20	17 46	18 15	15 00	15 59	17 05	18 15
35	17 09	17 37	18 08	14 48	15 46	16 52	18 03
40	16 57	17 27	18 00	14 33	15 30	16 37	17 51
45	16 43	17 15	17 52	14 16	15 12	16 19	17 35
S 50	16 25	17 02	17 42	13 55	14 49	15 57	17 16
52	16 17	16 56	17 38	13 45	14 38	15 47	17 08
54	16 08	16 49	17 33	13 34	14 26	15 35	16 58
56	15 57	16 41	17 29	13 21	14 12	15 22	16 46
58	15 45	16 33	17 23	13 06	13 55	15 06	16 33
S 60	15 31	16 24	17 18	12 48	13 36	14 47	16 18

Día	SOL E.T. (−) 00h	SOL E.T. (−) 12h	SOL Pas. Mer.	LUNA Pas. Sup.	LUNA Mer. Inf.	LUNA Edad	LUNA Fase
d	m s	m s	h m	h m	h m	d	%
18	06 10	06 13	12 06	09 43	22 14	27	8
19	06 15	06 17	12 06	10 45	23 16	28	3
20	06 19	06 21	12 06	11 48	24 20	29	0

T.U.	ARIES	VENUS −4.1		MARTE −1.7		JUPITER −1.9		SATURNO +0.2	
	A.H.G.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
21 00	298 49.5	222 48.4	N20 36.2	45 30.5	S26 50.2	206 54.8	N23 09.7	228 58.7	N20 25.8
01	313 52.0	237 47.9	36.6	60 32.9	50.2	221 56.7	09.7	244 00.9	25.8
02	328 54.5	252 47.3	37.0	75 35.4	50.2	236 58.6	09.7	259 03.1	25.9
03	343 56.9	267 46.8 . .	37.3	90 37.8 . .	50.2	252 00.4 . .	09.7	274 05.2 . .	25.9
04	358 59.4	282 46.3	37.7	105 40.2	50.2	267 02.3	09.6	289 07.4	25.9
05	14 01.9	297 45.8	38.1	120 42.6	50.2	282 04.2	09.6	304 09.6	26.0
06	29 04.3	312 45.3	N20 38.4	135 45.0	S26 50.2	297 06.1	N23 09.6	319 11.8	N20 26.0
07	44 06.8	327 44.8	38.8	150 47.4	50.2	312 07.9	09.6	334 14.0	26.0
S 08	59 09.3	342 44.3	39.2	165 49.8	50.2	327 09.8	09.6	349 16.2	26.1
A 09	74 11.7	357 43.7 . .	39.5	180 52.2 . .	50.2	342 11.7 . .	09.6	4 18.4 . .	26.1
B 10	89 14.2	12 43.2	39.9	195 54.7	50.2	357 13.6	09.6	19 20.6	26.1
A 11	104 16.7	27 42.7	40.3	210 57.1	50.2	12 15.4	09.6	34 22.8	26.2
12	119 19.1	42 42.2	N20 40.6	225 59.5	S26 50.2	27 17.3	N23 09.6	49 25.0	N20 26.2
D 13	134 21.6	57 41.7	41.0	241 01.9	50.2	42 19.2	09.6	64 27.2	26.2
O 14	149 24.0	72 41.1	41.4	256 04.3	50.2	57 21.1	09.6	79 29.4	26.3
15	164 26.5	87 40.6 . .	41.7	271 06.7 . .	50.2	72 22.9 . .	09.6	94 31.6 . .	26.3
16	179 29.0	102 40.1	42.1	286 09.1	50.2	87 24.8	09.6	109 33.8	26.3
17	194 31.4	117 39.6	42.4	301 11.5	50.2	102 26.7	09.6	124 36.0	26.3
18	209 33.9	132 39.1	N20 42.8	316 13.8	S26 50.2	117 28.6	N23 09.6	139 38.2	N20 26.4
19	224 36.4	147 38.5	43.1	331 16.2	50.2	132 30.4	09.6	154 40.4	26.4
20	239 38.8	162 38.0	43.5	346 18.6	50.2	147 32.3	09.6	169 42.6	26.4
21	254 41.3	177 37.5 . .	43.9	1 21.0 . .	50.2	162 34.2 . .	09.6	184 44.8 . .	26.5
22	269 43.8	192 37.0	44.2	16 23.4	50.2	177 36.1	09.6	199 47.0	26.5
23	284 46.2	207 36.5	44.6	31 25.8	50.2	192 37.9	09.6	214 49.2	26.5
22 00	299 48.7	222 35.9	N20 44.9	46 28.2	S26 50.2	207 39.8	N23 09.6	229 51.4	N20 26.6
01	314 51.2	237 35.4	45.3	61 30.6	50.2	222 41.7	09.6	244 53.6	26.6
02	329 53.6	252 34.9	45.6	76 32.9	50.2	237 43.6	09.6	259 55.8	26.6
03	344 56.1	267 34.4 . .	46.0	91 35.3 . .	50.2	252 45.5 . .	09.5	274 58.0 . .	26.7
04	359 58.5	282 33.8	46.3	106 37.7	50.2	267 47.3	09.5	290 00.2	26.7
05	15 01.0	297 33.3	46.7	121 40.1	50.2	282 49.2	09.5	305 02.3	26.7
06	30 03.5	312 32.8	N20 47.0	136 42.4	S26 50.2	297 51.1	N23 09.5	320 04.5	N20 26.8
07	45 05.9	327 32.2	47.4	151 44.8	50.2	312 53.0	09.5	335 06.7	26.8
D 08	60 08.4	342 31.7	47.7	166 47.2	50.2	327 54.8	09.5	350 08.9	26.8
O 09	75 10.9	357 31.2 . .	48.1	181 49.6 . .	50.2	342 56.7 . .	09.5	5 11.1 . .	26.9
M 10	90 13.3	12 30.7	48.4	196 51.9	50.2	357 58.6	09.5	20 13.3	26.9
I 11	105 15.8	27 30.1	48.8	211 54.3	50.2	13 00.5	09.5	35 15.5	26.9
12	120 18.3	42 29.6	N20 49.1	226 56.6	S26 50.2	28 02.3	N23 09.5	50 17.7	N20 27.0
N 13	135 20.7	57 29.1	49.4	241 59.0	50.2	43 04.2	09.5	65 19.9	27.0
G 14	150 23.2	72 28.5	49.8	257 01.4	50.2	58 06.1	09.5	80 22.1	27.0
O 15	165 25.6	87 28.0 . .	50.1	272 03.7 . .	50.2	73 08.0 . .	09.5	95 24.3 . .	27.0
16	180 28.1	102 27.5	50.5	287 06.1	50.2	88 09.9	09.5	110 26.5	27.1
17	195 30.6	117 26.9	50.8	302 08.4	50.2	103 11.7	09.5	125 28.7	27.1
18	210 33.0	132 26.4	N20 51.1	317 10.8	S26 50.2	118 13.6	N23 09.5	140 30.9	N20 27.1
19	225 35.5	147 25.9	51.5	332 13.2	50.2	133 15.5	09.5	155 33.1	27.2
20	240 38.0	162 25.4	51.8	347 15.5	50.2	148 17.4	09.5	170 35.3	27.2
21	255 40.4	177 24.8 . .	52.2	2 17.8 . .	50.2	163 19.2 . .	09.5	185 37.5 . .	27.2
22	270 42.9	192 24.3	52.5	17 20.2	50.3	178 21.1	09.4	200 39.7	27.3
23	285 45.4	207 23.7	52.8	32 22.5	50.3	193 23.0	09.4	215 41.9	27.3
23 00	300 47.8	222 23.2	N20 53.2	47 24.9	S26 50.3	208 24.9	N23 09.4	230 44.1	N20 27.3
01	315 50.3	237 22.7	53.5	62 27.2	50.3	223 26.8	09.4	245 46.3	27.4
02	330 52.8	252 22.1	53.8	77 29.6	50.3	238 28.6	09.4	260 48.5	27.4
03	345 55.2	267 21.6 . .	54.1	92 31.9 . .	50.3	253 30.5 . .	09.4	275 50.7 . .	27.4
04	0 57.7	282 21.1	54.5	107 34.2	50.3	268 32.4	09.4	290 52.9	27.5
05	16 00.1	297 20.5	54.8	122 36.6	50.3	283 34.3	09.4	305 55.1	27.5
06	31 02.6	312 20.0	N20 55.1	137 38.9	S26 50.3	298 36.1	N23 09.4	320 57.3	N20 27.5
07	46 05.1	327 19.5	55.5	152 41.2	50.3	313 38.0	09.4	335 59.5	27.5
08	61 07.5	342 18.9	55.8	167 43.6	50.3	328 39.9	09.4	351 01.7	27.6
L 09	76 10.0	357 18.4 . .	56.1	182 45.9 . .	50.3	343 41.8 . .	09.4	6 03.9 . .	27.6
U 10	91 12.5	12 17.8	56.4	197 48.2	50.3	358 43.7	09.4	21 06.1	27.6
N 11	106 14.9	27 17.3	56.8	212 50.6	50.3	13 45.5	09.4	36 08.3	27.7
12	121 17.4	42 16.8	N20 57.1	227 52.9	S26 50.3	28 47.4	N23 09.4	51 10.5	N20 27.7
E 13	136 19.9	57 16.2	57.4	242 55.2	50.3	43 49.3	09.4	66 12.7	27.7
S 14	151 22.3	72 15.7	57.7	257 57.5	50.3	58 51.2	09.4	81 14.9	27.8
15	166 24.8	87 15.1 . .	58.1	272 59.9 . .	50.3	73 53.1 . .	09.3	96 17.1 . .	27.8
16	181 27.3	102 14.6	58.4	288 02.2	50.3	88 54.9	09.3	111 19.3	27.8
17	196 29.7	117 14.0	58.7	303 04.5	50.3	103 56.8	09.3	126 21.5	27.9
18	211 32.2	132 13.5	N20 59.0	318 06.8	S26 50.3	118 58.7	N23 09.3	141 23.7	N20 27.9
19	226 34.6	147 13.0	59.3	333 09.1	50.3	134 00.6	09.3	156 25.9	27.9
20	241 37.1	162 12.4	20 59.6	348 11.4	50.3	149 02.5	09.3	171 28.1	27.9
21	256 39.6	177 11.9	21 00.0	3 13.7 . .	50.3	164 04.3 . .	09.3	186 30.3 . .	28.0
22	271 42.0	192 11.3	00.3	18 16.0	50.3	179 06.2	09.3	201 32.5	28.0
23	286 44.5	207 10.8	00.6	33 18.4	50.3	194 08.1	09.3	216 34.7	28.0
	h m								
Pas. Mer.	4 00.1	v −0.5	d 0.3	v 2.4	d 0.0	v 1.9	d 0.0	v 2.2	d 0.0

ESTRELLAS

Nombre	A.H.S.	Dec.
	° ′	° ′
Acamar	315 25.5	S40 17.7
Achernar	335 33.6	S57 13.5
Acrux	173 20.2	S63 06.6
Adhara	255 20.2	S28 58.4
Aldebaran	291 00.3	N16 30.7
Alioth	166 28.9	N55 57.5
Alkaid	153 06.2	N49 18.7
Al Na'ir	27 54.9	S46 57.1
Alnilam	275 56.1	S 1 12.0
Alphard	218 05.6	S 8 39.8
Alphecca	126 18.7	N26 42.8
Alpheratz	357 53.0	N29 05.8
Altair	62 17.0	N 8 52.4
Ankaa	353 24.7	S42 17.7
Antares	112 37.5	S26 26.1
Arcturus	146 04.2	N19 10.7
Atria	107 47.4	S69 02.0
Avior	234 22.5	S59 30.8
Bellatrix	278 42.3	N 6 21.1
Betelgeuse	271 11.7	N 7 24.5
Canopus	264 00.8	S52 41.7
Capella	280 48.7	N45 59.8
Deneb	49 37.4	N45 17.1
Denebola	182 43.3	N14 34.0
Diphda	349 05.1	S17 58.6
Dubhe	194 03.4	N61 44.9
Elnath	278 24.7	N28 36.4
Eltanin	90 50.0	N51 29.5
Enif	33 56.0	N 9 52.9
Fomalhaut	15 34.0	S29 36.8
Gacrux	172 11.7	S57 07.4
Gienah	176 02.1	S17 33.0
Hadar	149 01.3	S60 23.0
Hamal	328 11.4	N23 28.0
Kaus Aust.	83 55.8	S34 23.0
Kochab	137 19.2	N74 09.4
Markab	13 47.4	N15 12.7
Menkar	314 24.9	N 4 05.7
Menkent	148 18.6	S36 22.7
Miaplacidus	221 42.7	S69 43.4
Mirfak	308 54.0	N49 51.7
Nunki	76 09.5	S26 17.7
Peacock	53 33.2	S56 43.8
Pollux	243 39.5	N28 01.4
Procyon	245 09.8	N 5 13.4
Rasalhague	96 14.8	N12 33.7
Regulus	207 53.7	N11 57.8
Rigel	281 21.3	S 8 11.9
Rigil Kent.	140 04.6	S60 50.6
Sabik	102 23.0	S15 43.6
Schedar	349 51.1	N56 32.4
Shaula	96 34.3	S37 06.3
Sirius	258 42.3	S16 43.0
Spica	158 41.2	S11 10.1
Suhail	222 59.8	S43 26.3
Vega	80 44.9	N38 47.2
Zuben'ubi	137 15.7	S16 02.8

	A.H.S.	Pas. Mer.
	° ′	h m
Venus	282 47.2	9 10
Marte	106 39.5	20 51
Júpiter	267 51.1	10 08
Saturno	290 02.7	8 39

T.U.	SOL				LUNA					
	A.H.G.		Dec.		A.H.G.	v	Dec.	d	P.H.	
d h	°	′	°	′	°	′	′	°	′	′	′
21 00	178	24.4	N20	29.9	175	17.8	3.2	N22	06.3	5.3	61.0
01	193	24.4		29.5	189	40.0	3.3	22	01.0	5.4	61.0
02	208	24.3		29.0	204	02.3	3.3	21	55.6	5.6	61.0
03	223	24.3	. .	28.5	218	24.6	3.3	21	50.0	5.8	61.0
04	238	24.3		28.0	232	46.9	3.4	21	44.2	6.0	61.0
05	253	24.2		27.5	247	09.3	3.4	21	38.2	6.1	61.0
06	268	24.2	N20	27.0	261	31.7	3.5	N21	32.1	6.2	61.0
07	283	24.2		26.6	275	54.2	3.5	21	25.9	6.4	61.0
S 08	298	24.1		26.1	290	16.7	3.6	21	19.5	6.6	61.0
A 09	313	24.1	. .	25.6	304	39.3	3.6	21	12.9	6.7	61.0
10	328	24.1		25.1	319	01.9	3.7	21	06.2	6.9	61.0
B 11	343	24.0		24.6	333	24.6	3.7	20	59.3	7.1	61.0
12	358	24.0	N20	24.1	347	47.3	3.8	N20	52.2	7.2	61.1
A 13	13	24.0		23.6	2	10.1	3.9	20	45.0	7.3	61.1
D 14	28	24.0		23.1	16	33.0	3.9	20	37.7	7.5	61.1
O 15	43	23.9	. .	22.7	30	55.9	4.0	20	30.2	7.7	61.1
16	58	23.9		22.2	45	18.9	4.0	20	22.5	7.8	61.1
17	73	23.9		21.7	59	41.9	4.1	20	14.7	7.9	61.1
18	88	23.8	N20	21.2	74	05.0	4.2	N20	06.8	8.1	61.1
19	103	23.8		20.7	88	28.2	4.2	19	58.7	8.3	61.1
20	118	23.8		20.2	102	51.4	4.3	19	50.4	8.3	61.1
21	133	23.8	. .	19.7	117	14.7	4.4	19	42.1	8.6	61.1
22	148	23.7		19.2	131	38.1	4.5	19	33.5	8.6	61.1
23	163	23.7		18.7	146	01.6	4.5	19	24.9	8.8	61.1
22 00	178	23.7	N20	18.2	160	25.1	4.6	N19	16.1	9.0	61.1
01	193	23.7		17.7	174	48.7	4.7	19	07.1	9.0	61.1
02	208	23.6		17.2	189	12.4	4.7	18	58.1	9.2	61.1
03	223	23.6	. .	16.7	203	36.1	4.8	18	48.9	9.4	61.1
04	238	23.6		16.2	217	59.9	4.9	18	39.5	9.4	61.1
05	253	23.6		15.7	232	23.8	5.0	18	30.1	9.6	61.1
06	268	23.5	N20	15.2	246	47.8	5.1	N18	20.5	9.7	61.1
07	283	23.5		14.7	261	11.9	5.1	18	10.8	9.9	61.0
D 08	298	23.5		14.2	275	36.0	5.2	18	00.9	10.0	61.0
O 09	313	23.5	. .	13.7	290	00.2	5.3	17	50.9	10.0	61.0
M 10	328	23.4		13.2	304	24.5	5.4	17	40.9	10.3	61.0
I 11	343	23.4		12.7	318	48.9	5.5	17	30.6	10.3	61.0
12	358	23.4	N20	12.2	333	13.4	5.6	N17	20.3	10.4	61.0
N 13	13	23.4		11.7	347	38.0	5.6	17	09.9	10.6	61.0
G 14	28	23.3		11.2	2	02.6	5.7	16	59.3	10.6	61.0
O 15	43	23.3	. .	10.7	16	27.3	5.8	16	48.7	10.8	61.0
16	58	23.3		10.2	30	52.1	5.9	16	37.9	10.9	61.0
17	73	23.3		09.7	45	17.0	6.0	16	27.0	11.0	61.0
18	88	23.2	N20	09.2	59	42.0	6.0	N16	16.0	11.1	61.0
19	103	23.2		08.7	74	07.0	6.2	16	04.9	11.2	60.9
20	118	23.2		08.2	88	32.2	6.2	15	53.7	11.3	60.9
21	133	23.2	. .	07.7	102	57.4	6.3	15	42.4	11.4	60.9
22	148	23.2		07.2	117	22.7	6.5	15	31.0	11.5	60.9
23	163	23.1		06.7	131	48.2	6.4	15	19.5	11.6	60.9
23 00	178	23.1	N20	06.2	146	13.6	6.6	N15	07.9	11.7	60.9
01	193	23.1		05.7	160	39.2	6.7	14	56.2	11.8	60.9
02	208	23.1		05.2	175	04.9	6.7	14	44.4	11.9	60.9
03	223	23.1	. .	04.6	189	30.6	6.9	14	32.5	12.0	60.8
04	238	23.0		04.1	203	56.5	6.9	14	20.5	12.0	60.8
05	253	23.0		03.6	218	22.4	7.0	14	08.5	12.2	60.8
06	268	23.0	N20	03.1	232	48.4	7.1	N13	56.3	12.2	60.8
07	283	23.0		02.6	247	14.5	7.2	13	44.1	12.3	60.8
08	298	23.0		02.1	261	40.7	7.3	13	31.8	12.4	60.8
L 09	313	22.9	. .	01.6	276	07.0	7.3	13	19.4	12.4	60.7
U 10	328	22.9		01.1	290	33.3	7.5	13	07.0	12.6	60.7
N 11	343	22.9		00.5	304	59.8	7.5	12	54.4	12.6	60.7
12	358	22.9	N20	00.0	319	26.3	7.6	N12	41.8	12.6	60.7
E 13	13	22.9	19	59.5	333	52.9	7.7	12	29.2	12.8	60.7
S 14	28	22.9		59.0	348	19.6	7.8	12	16.4	12.8	60.6
15	43	22.8	. .	58.5	2	46.4	7.8	12	03.6	12.9	60.6
16	58	22.8		58.0	17	13.2	8.0	11	50.7	12.9	60.6
17	73	22.8		57.4	31	40.2	8.0	11	37.8	13.1	60.6
18	88	22.8	N19	56.9	46	07.2	8.1	N11	24.7	13.0	60.6
19	103	22.8		56.4	60	34.3	8.2	11	11.7	13.2	60.5
20	118	22.8		55.9	75	01.5	8.2	10	58.5	13.1	60.5
21	133	22.7	. .	55.4	89	28.7	8.4	10	45.4	13.3	60.5
22	148	22.7		54.8	103	56.1	8.4	10	32.1	13.3	60.5
23	163	22.7		54.3	118	23.5	8.5	N10	18.8	13.3	60.5
	SD	15.8	d	0.5	SD		16.6		16.6		16.5

Lat.	Crepúsculo Náutico	Crepúsculo Civil	Orto Sol	Orto Luna 21	Orto Luna 22	Orto Luna 23	Orto Luna 24
°	h m	h m	h m	h m	h m	h m	h m
N 72	▭	▭	▭	▭	▭	05 08	07 40
N 70	▭	▭	▭	▭	02 53	05 38	07 53
68	////	////	01 14	00 48	03 43	06 00	08 03
66	////	////	02 05	02 10	04 15	06 17	08 12
64	////	////	02 37	02 48	04 38	06 30	08 19
62	////	01 31	03 00	03 14	04 56	06 42	08 25
60	////	02 08	03 18	03 35	05 11	06 52	08 31
N 58	////	02 33	03 33	03 52	05 24	07 00	08 35
56	01 23	02 53	03 46	04 06	05 35	07 08	08 39
54	01 57	03 09	03 57	04 18	05 45	07 15	08 43
52	02 21	03 23	04 07	04 29	05 53	07 20	08 46
50	02 39	03 35	04 16	04 39	06 01	07 26	08 50
45	03 14	03 59	04 34	04 59	06 17	07 37	08 56
N 40	03 39	04 18	04 49	05 15	06 31	07 47	09 02
35	03 59	04 33	05 02	05 29	06 42	07 55	09 06
30	04 15	04 46	05 13	05 41	06 52	08 02	09 10
20	04 40	05 08	05 32	06 02	07 09	08 15	09 17
N 10	04 59	05 25	05 48	06 20	07 24	08 25	09 24
0	05 15	05 41	06 03	06 36	07 37	08 35	09 30
S 10	05 30	05 55	06 18	06 53	07 51	08 45	09 35
20	05 43	06 10	06 33	07 10	08 06	08 56	09 42
30	05 57	06 26	06 51	07 31	08 22	09 08	09 49
35	06 04	06 35	07 02	07 43	08 32	09 15	09 53
40	06 11	06 44	07 14	07 56	08 43	09 23	09 57
45	06 19	06 55	07 28	08 12	08 56	09 32	10 03
S 50	06 28	07 08	07 45	08 32	09 12	09 43	10 09
52	06 32	07 14	07 53	08 41	09 19	09 48	10 12
54	06 36	07 21	08 01	08 52	09 27	09 54	10 15
56	06 41	07 28	08 11	09 04	09 36	10 00	10 18
58	06 46	07 36	08 23	09 17	09 46	10 07	10 22
S 60	06 52	07 45	08 36	09 33	09 58	10 15	10 27

Lat.	Ocaso Sol	Crepúsculo Civil	Crepúsculo Náutico	Ocaso Luna 21	Ocaso Luna 22	Ocaso Luna 23	Ocaso Luna 24
°	h m	h m	h m	h m	h m	h m	h m
N 72	▭	▭	▭	▭	23 56	23 20	22 55
N 70	▭	▭	▭	▭	{00 23 / 06 25}	23 04	22 49
68	22 52	////	////	{00 23 / 00 15}	23 01	22 52	22 43
66	22 04	////	////	22 42	22 43	22 41	22 39
64	21 34	////	////	22 18	22 27	22 32	22 35
62	21 11	22 38	////	21 59	22 15	22 25	22 32
60	20 53	22 02	////	21 43	22 04	22 18	22 29
N 58	20 39	21 38	////	21 30	21 54	22 12	22 27
56	20 26	21 18	22 46	21 18	21 46	22 07	22 24
54	20 15	21 02	22 13	21 08	21 39	22 02	22 22
52	20 05	20 49	21 50	20 59	21 32	21 58	22 20
50	19 56	20 37	21 32	20 51	21 26	21 54	22 18
45	19 38	20 13	20 58	20 33	21 13	21 46	22 15
N 40	19 23	19 54	20 33	20 19	21 02	21 39	22 11
35	19 10	19 39	20 14	20 06	20 52	21 33	22 09
30	19 00	19 26	19 58	19 56	20 44	21 27	22 06
20	18 41	19 05	19 33	19 37	20 30	21 18	22 02
N 10	18 25	18 47	19 14	19 21	20 17	21 09	21 58
0	18 10	18 32	18 58	19 06	20 05	21 01	21 54
S 10	17 55	18 18	18 43	18 50	19 53	20 53	21 50
20	17 40	18 03	18 30	18 34	19 40	20 45	21 46
30	17 22	17 47	18 17	18 15	19 26	20 35	21 42
35	17 11	17 39	18 10	18 03	19 17	20 29	21 39
40	17 00	17 29	18 02	17 51	19 07	20 23	21 36
45	16 46	17 18	17 54	17 35	18 55	20 15	21 33
S 50	16 29	17 05	17 45	17 16	18 41	20 06	21 28
52	16 21	16 59	17 41	17 08	18 34	20 01	21 26
54	16 12	16 53	17 37	16 58	18 27	19 57	21 24
56	16 02	16 46	17 32	16 46	18 18	19 51	21 22
58	15 51	16 38	17 27	16 33	18 09	19 45	21 19
S 60	15 37	16 29	17 22	16 18	17 58	19 39	21 16

Día	SOL E.T. (−) 00h	SOL E.T. (−) 12h	SOL Pas. Mer.	LUNA Pas. Sup.	LUNA Mer. Inf.	LUNA Edad	LUNA Fase
d	m s	m s	h m	h m	h m	d	%
21	06 22	06 24	12 06	12 51	00 20	01	1
22	06 25	06 26	12 06	13 51	01 22	02	4
23	06 27	06 28	12 06	14 48	02 20	03	11

T.U.	ARIES	VENUS −4.0		MARTE −1.7		JUPITER −1.9		SATURNO +0.2	
	A.H.G.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
24 00	301 47.0	222 10.2	N21 00.9	48 20.7	S26 50.3	209 10.0	N23 09.3	231 37.0	N20 28.1
01	316 49.4	237 09.7	01.2	63 23.0	50.4	224 11.9	09.3	246 39.2	28.1
02	331 51.9	252 09.1	01.5	78 25.3	50.4	239 13.7	09.3	261 41.4	28.1
03	346 54.4	267 08.6	01.8	93 27.6	50.4	254 15.6	09.3	276 43.6	28.2
04	1 56.8	282 08.0	02.1	108 29.9	50.4	269 17.5	09.3	291 45.8	28.2
05	16 59.3	297 07.5	02.5	123 32.2	50.4	284 19.4	09.3	306 48.0	28.2
06	32 01.7	312 07.0	N21 02.8	138 34.5	S26 50.4	299 21.3	N23 09.3	321 50.2	N20 28.2
07	47 04.2	327 06.4	03.1	153 36.7	50.4	314 23.1	09.2	336 52.4	28.3
M 08	62 06.7	342 05.9	03.4	168 39.0	50.4	329 25.0	09.2	351 54.6	28.3
09	77 09.1	357 05.3	03.7	183 41.3	50.4	344 26.9	09.2	6 56.8	28.3
A 10	92 11.6	12 04.8	04.0	198 43.6	50.4	359 28.8	09.2	21 59.0	28.4
R 11	107 14.1	27 04.2	04.3	213 45.9	50.4	14 30.7	09.2	37 01.2	28.4
T 12	122 16.5	42 03.7	N21 04.6	228 48.2	S26 50.4	29 32.5	N23 09.2	52 03.4	N20 28.4
13	137 19.0	57 03.1	04.9	243 50.5	50.4	44 34.4	09.2	67 05.6	28.5
E 14	152 21.5	72 02.5	05.2	258 52.8	50.4	59 36.3	09.2	82 07.8	28.5
S 15	167 23.9	87 02.0	05.5	273 55.0	50.4	74 38.2	09.2	97 10.0	28.5
16	182 26.4	102 01.4	05.8	288 57.3	50.4	89 40.1	09.2	112 12.2	28.6
17	197 28.9	117 00.9	06.1	303 59.6	50.4	104 42.0	09.2	127 14.4	28.6
18	212 31.3	132 00.3	N21 06.4	319 01.9	S26 50.4	119 43.8	N23 09.2	142 16.6	N20 28.6
19	227 33.8	146 59.8	06.7	334 04.1	50.4	134 45.7	09.2	157 18.8	28.6
20	242 36.2	161 59.2	07.0	349 06.4	50.5	149 47.6	09.2	172 21.0	28.7
21	257 38.7	176 58.7	07.3	4 08.7	50.5	164 49.5	09.1	187 23.2	28.7
22	272 41.2	191 58.1	07.6	19 11.0	50.5	179 51.4	09.1	202 25.4	28.7
23	287 43.6	206 57.6	07.9	34 13.2	50.5	194 53.2	09.1	217 27.6	28.8
25 00	302 46.1	221 57.0	N21 08.2	49 15.5	S26 50.5	209 55.1	N23 09.1	232 29.8	N20 28.8
01	317 48.6	236 56.4	08.5	64 17.8	50.5	224 57.0	09.1	247 32.0	28.8
02	332 51.0	251 55.9	08.7	79 20.0	50.5	239 58.9	09.1	262 34.3	28.9
03	347 53.5	266 55.3	09.0	94 22.3	50.5	255 00.8	09.1	277 36.5	28.9
04	2 56.0	281 54.8	09.3	109 24.5	50.5	270 02.7	09.1	292 38.7	28.9
05	17 58.4	296 54.2	09.6	124 26.8	50.5	285 04.5	09.1	307 40.9	28.9
06	33 00.9	311 53.7	N21 09.9	139 29.0	S26 50.5	300 06.4	N23 09.1	322 43.1	N20 29.0
M 07	48 03.4	326 53.1	10.2	154 31.3	50.5	315 08.3	09.1	337 45.3	29.0
I 08	63 05.8	341 52.5	10.5	169 33.6	50.5	330 10.2	09.1	352 47.5	29.0
E 09	78 08.3	356 52.0	10.8	184 35.8	50.5	345 12.1	09.1	7 49.7	29.1
R 10	93 10.7	11 51.4	11.0	199 38.1	50.5	0 14.0	09.1	22 51.9	29.1
C 11	108 13.2	26 50.9	11.3	214 40.3	50.5	15 15.8	09.0	37 54.1	29.1
O 12	123 15.7	41 50.3	N21 11.6	229 42.6	S26 50.6	30 17.7	N23 09.0	52 56.3	N20 29.1
L 13	138 18.1	56 49.7	11.9	244 44.8	50.6	45 19.6	09.0	67 58.5	29.2
E 14	153 20.6	71 49.2	12.2	259 47.0	50.6	60 21.5	09.0	83 00.7	29.2
S 15	168 23.1	86 48.6	12.4	274 49.3	50.6	75 23.4	09.0	98 02.9	29.2
16	183 25.5	101 48.0	12.7	289 51.5	50.6	90 25.3	09.0	113 05.1	29.3
17	198 28.0	116 47.5	13.0	304 53.8	50.6	105 27.2	09.0	128 07.3	29.3
18	213 30.5	131 46.9	N21 13.3	319 56.0	S26 50.6	120 29.0	N23 09.0	143 09.6	N20 29.3
19	228 32.9	146 46.4	13.5	334 58.2	50.6	135 30.9	09.0	158 11.8	29.4
20	243 35.4	161 45.8	13.8	350 00.5	50.6	150 32.8	09.0	173 14.0	29.4
21	258 37.8	176 45.2	14.1	5 02.7	50.6	165 34.7	09.0	188 16.2	29.4
22	273 40.3	191 44.7	14.4	20 04.9	50.6	180 36.6	09.0	203 18.4	29.4
23	288 42.8	206 44.1	14.6	35 07.2	50.6	195 38.5	08.9	218 20.6	29.5
26 00	303 45.2	221 43.5	N21 14.9	50 09.4	S26 50.6	210 40.3	N23 08.9	233 22.8	N20 29.5
01	318 47.7	236 43.0	15.2	65 11.6	50.6	225 42.2	08.9	248 25.0	29.5
02	333 50.2	251 42.4	15.5	80 13.8	50.7	240 44.1	08.9	263 27.2	29.6
03	348 52.6	266 41.8	15.7	95 16.1	50.7	255 46.0	08.9	278 29.4	29.6
04	3 55.1	281 41.3	16.0	110 18.3	50.7	270 47.9	08.9	293 31.6	29.6
05	18 57.6	296 40.7	16.3	125 20.5	50.7	285 49.8	08.9	308 33.8	29.6
06	34 00.0	311 40.1	N21 16.5	140 22.7	S26 50.7	300 51.7	N23 08.9	323 36.0	N20 29.7
07	49 02.5	326 39.6	16.8	155 24.9	50.7	315 53.5	08.9	338 38.3	29.7
J 08	64 05.0	341 39.0	17.1	170 27.2	50.7	330 55.4	08.9	353 40.5	29.7
U 09	79 07.4	356 38.4	17.3	185 29.4	50.7	345 57.3	08.9	8 42.7	29.8
E 10	94 09.9	11 37.8	17.6	200 31.6	50.7	0 59.2	08.9	23 44.9	29.8
11	109 12.3	26 37.3	17.8	215 33.8	50.7	16 01.1	08.8	38 47.1	29.8
V 12	124 14.8	41 36.7	N21 18.1	230 36.0	S26 50.7	31 03.0	N23 08.8	53 49.3	N20 29.8
13	139 17.3	56 36.1	18.4	245 38.2	50.7	46 04.9	08.8	68 51.5	29.9
E 14	154 19.7	71 35.6	18.6	260 40.4	50.7	61 06.7	08.8	83 53.7	29.9
S 15	169 22.2	86 35.0	18.9	275 42.6	50.8	76 08.6	08.8	98 55.9	29.9
16	184 24.7	101 34.4	19.1	290 44.8	50.8	91 10.5	08.8	113 58.1	30.0
17	199 27.1	116 33.8	19.4	305 47.0	50.8	106 12.4	08.8	129 00.4	30.0
18	214 29.6	131 33.3	N21 19.6	320 49.2	S26 50.8	121 14.3	N23 08.8	144 02.6	N20 30.0
19	229 32.1	146 32.7	19.9	335 51.4	50.8	136 16.2	08.8	159 04.8	30.1
20	244 34.5	161 32.1	20.2	350 53.6	50.8	151 18.1	08.8	174 07.0	30.1
21	259 37.0	176 31.5	20.4	5 55.8	50.8	166 19.9	08.8	189 09.2	30.1
22	274 39.4	191 31.0	20.7	20 58.0	50.8	181 21.8	08.8	204 11.4	30.1
23	289 41.9	206 30.4	20.9	36 00.2	50.8	196 23.7	08.7	219 13.6	30.2
Pas. Mer.	h m 3 48.3	v −0.6	d 0.3	v 2.2	d 0.0	v 1.9	d 0.0	v 2.2	d 0.0

ESTRELLAS

Nombre	A.H.S. ° ′	Dec. ° ′
Acamar	315 25.5	S40 17.7
Achernar	335 33.5	S57 13.5
Acrux	173 20.2	S63 06.6
Adhara	255 20.2	S28 58.3
Aldebaran	291 00.3	N16 30.7
Alioth	166 28.9	N55 57.5
Alkaid	153 06.2	N49 18.7
Al Na'ir	27 54.9	S46 57.1
Alnilam	275 56.1	S 1 12.0
Alphard	218 05.6	S 8 39.8
Alphecca	126 18.8	N26 42.8
Alpheratz	357 53.0	N29 05.8
Altair	62 17.0	N 8 52.4
Ankaa	353 24.7	S42 17.7
Antares	112 37.5	S26 26.1
Arcturus	146 04.2	N19 10.7
Atria	107 47.4	S69 02.0
Avior	234 22.5	S59 30.8
Bellatrix	278 42.3	N 6 21.1
Betelgeuse	271 11.7	N 7 24.5
Canopus	264 00.8	S52 41.6
Capella	280 48.6	N45 59.8
Deneb	49 37.4	N45 17.1
Denebola	182 43.3	N14 34.0
Diphda	349 05.1	S17 58.6
Dubhe	194 03.5	N61 44.9
Elnath	278 24.7	N28 36.5
Eltanin	90 50.0	N51 29.5
Enif	33 56.0	N 9 52.9
Fomalhaut	15 33.9	S29 36.8
Gacrux	172 11.7	S57 07.4
Gienah	176 02.1	S17 32.9
Hadar	149 01.3	S60 23.0
Hamal	328 11.3	N23 28.0
Kaus Aust.	83 55.8	S34 23.0
Kochab	137 19.2	N74 09.4
Markab	13 47.4	N15 12.7
Menkar	314 24.9	N 4 05.7
Menkent	148 18.6	S36 22.7
Miaplacidus	221 42.7	S69 43.4
Mirfak	308 54.0	N49 51.7
Nunki	76 09.5	S26 17.7
Peacock	53 33.2	S56 43.8
Pollux	243 39.5	N28 01.4
Procyon	245 09.8	N 5 13.4
Rasalhague	96 14.8	N12 33.7
Regulus	207 53.7	N11 57.8
Rigel	281 21.3	S 8 11.9
Rigil Kent.	140 04.6	S60 50.6
Sabik	102 23.0	S15 43.6
Schedar	349 51.1	N56 32.4
Shaula	96 34.3	S37 06.3
Sirius	258 42.3	S16 43.0
Spica	158 41.2	S11 10.1
Suhail	222 59.8	S43 26.3
Vega	80 44.9	N38 47.2
Zuben'ubi	137 15.7	S16 02.8

	A.H.S. ° ′	Pas. Mer. h m
Venus	279 10.9	9 13
Marte	106 29.4	20 40
Júpiter	267 09.0	9 59
Saturno	289 43.7	8 29

T.U.	SOL				LUNA						
	A.H.G.		Dec.		A.H.G.	v		Dec.	d	P.H.	
d h	°	′	°	′	°	′	′	°	′	′	′
24 00	178	22.7	N19	53.8	132	51.0	8.6	N10	05.5	13.4	60.4
01	193	22.7		53.3	147	18.6	8.7	9	52.1	13.5	60.4
02	208	22.7		52.7	161	46.3	8.7	9	38.6	13.5	60.4
03	223	22.7	. .	52.2	176	14.0	8.8	9	25.1	13.5	60.4
04	238	22.7		51.7	190	41.8	8.9	9	11.6	13.6	60.3
05	253	22.6		51.2	205	09.7	8.9	8	58.0	13.6	60.3
06	268	22.6	N19	50.6	219	37.6	9.1	N 8	44.4	13.7	60.3
07	283	22.6		50.1	234	05.7	9.1	8	30.7	13.7	60.3
M 08	298	22.6		49.6	248	33.8	9.2	8	17.0	13.7	60.2
A 09	313	22.6	. .	49.1	263	02.0	9.2	8	03.3	13.8	60.2
R 10	328	22.6		48.5	277	30.2	9.3	7	49.5	13.8	60.2
11	343	22.6		48.0	291	58.5	9.4	7	35.7	13.8	60.2
T 12	358	22.6	N19	47.5	306	26.9	9.5	N 7	21.9	13.9	60.1
13	13	22.5		46.9	320	55.4	9.5	7	08.0	13.9	60.1
E 14	28	22.5		46.4	335	23.9	9.6	6	54.1	13.9	60.1
15	43	22.5	. .	45.9	349	52.5	9.6	6	40.2	13.9	60.0
S 16	58	22.5		45.4	4	21.1	9.8	6	26.3	14.0	60.0
17	73	22.5		44.8	18	49.9	9.7	6	12.3	14.0	60.0
18	88	22.5	N19	44.3	33	18.6	9.9	N 5	58.3	14.0	60.0
19	103	22.5		43.8	47	47.5	9.9	5	44.3	14.0	59.9
20	118	22.5		43.2	62	16.4	10.0	5	30.3	14.1	59.9
21	133	22.5	. .	42.7	76	45.4	10.0	5	16.2	14.0	59.9
22	148	22.5		42.1	91	14.4	10.1	5	02.2	14.1	59.8
23	163	22.4		41.6	105	43.5	10.2	4	48.1	14.1	59.8
25 00	178	22.4	N19	41.1	120	12.7	10.2	N 4	34.0	14.1	59.8
01	193	22.4		40.5	134	41.9	10.2	4	19.9	14.1	59.8
02	208	22.4		40.0	149	11.1	10.3	4	05.8	14.1	59.7
03	223	22.4	. .	39.5	163	40.4	10.4	3	51.7	14.1	59.7
04	238	22.4		38.9	178	09.8	10.4	3	37.6	14.1	59.7
05	253	22.4		38.4	192	39.2	10.5	3	23.5	14.2	59.6
06	268	22.4	N19	37.8	207	08.7	10.5	N 3	09.3	14.1	59.6
M 07	283	22.4		37.3	221	38.2	10.6	2	55.2	14.1	59.6
I 08	298	22.4		36.8	236	07.8	10.6	2	41.1	14.2	59.5
E 09	313	22.4	. .	36.2	250	37.4	10.7	2	26.9	14.1	59.5
R 10	328	22.4		35.7	265	07.1	10.7	2	12.8	14.1	59.5
C 11	343	22.4		35.1	279	36.8	10.8	1	58.7	14.1	59.4
O 12	358	22.4	N19	34.6	294	06.6	10.8	N 1	44.6	14.1	59.4
L 13	13	22.4		34.1	308	36.4	10.9	1	30.5	14.1	59.4
E 14	28	22.4		33.5	323	06.3	10.9	1	16.4	14.1	59.3
S 15	43	22.4	. .	33.0	337	36.2	10.9	1	02.3	14.1	59.3
16	58	22.4		32.4	352	06.1	11.0	0	48.2	14.1	59.3
17	73	22.3		31.9	6	36.1	11.0	0	34.1	14.0	59.3
18	88	22.3	N19	31.3	21	06.1	11.1	N 0	20.1	14.1	59.2
19	103	22.3		30.8	35	36.2	11.1	N 0	06.0	14.0	59.2
20	118	22.3		30.2	50	06.3	11.1	S 0	08.0	14.0	59.2
21	133	22.3	. .	29.7	64	36.4	11.2	0	22.0	14.0	59.1
22	148	22.3		29.1	79	06.6	11.2	0	36.0	14.0	59.1
23	163	22.3		28.6	93	36.8	11.3	0	50.0	14.0	59.1
26 00	178	22.3	N19	28.0	108	07.1	11.2	S 1	04.0	13.9	59.0
01	193	22.3		27.5	122	37.3	11.4	1	17.9	13.9	59.0
02	208	22.3		26.9	137	07.7	11.3	1	31.8	13.9	59.0
03	223	22.3	. .	26.4	151	38.0	11.4	1	45.7	13.8	58.9
04	238	22.3		25.8	166	08.4	11.4	1	59.5	13.9	58.9
05	253	22.3		25.3	180	38.8	11.4	2	13.4	13.8	58.9
06	268	22.3	N19	24.7	195	09.2	11.4	S 2	27.2	13.8	58.8
07	283	22.3		24.2	209	39.6	11.5	2	41.0	13.7	58.8
J 08	298	22.3		23.6	224	10.1	11.5	2	54.7	13.7	58.8
U 09	313	22.3	. .	23.1	238	40.6	11.5	3	08.4	13.7	58.7
10	328	22.3		22.5	253	11.1	11.6	3	22.1	13.6	58.7
E 11	343	22.3		21.9	267	41.7	11.5	3	35.7	13.7	58.7
V 12	358	22.3	N19	21.4	282	12.2	11.6	S 3	49.4	13.5	58.6
13	13	22.3		20.8	296	42.8	11.6	4	02.9	13.6	58.6
E 14	28	22.3		20.3	311	13.4	11.7	4	16.5	13.5	58.6
15	43	22.3	. .	19.7	325	44.1	11.6	4	30.0	13.4	58.5
S 16	58	22.3		19.2	340	14.7	11.7	4	43.4	13.5	58.5
17	73	22.3		18.6	354	45.4	11.7	4	56.9	13.4	58.5
18	88	22.3	N19	18.0	9	16.1	11.6	S 5	10.3	13.3	58.4
19	103	22.4		17.5	23	46.7	11.8	5	23.6	13.3	58.4
20	118	22.4		16.9	38	17.5	11.7	5	36.9	13.3	58.4
21	133	22.4	. .	16.4	52	48.2	11.7	5	50.2	13.2	58.3
22	148	22.4		15.8	67	18.9	11.7	6	03.4	13.1	58.3
23	163	22.4		15.2	81	49.6	11.8	S 6	16.5	13.1	58.3
	SD	15.8	d	0.5	SD		16.4		16.2		16.0

Lat.	Crepúsculo Náutico	Crepúsculo Civil	Orto Sol	Crto Luna 24	Crto Luna 25	Crto Luna 26	Crto Luna 27
°	h m	h m	h m	h m	h m	h m	h m
N 72	▭	▭	▭	07 40	09 54	12 01	14 08
N 70	▭	▭	▭	07 53	09 57	11 55	13 52
68	////	////	01 35	08 03	09 59	11 50	13 39
66	////	////	02 18	08 12	10 01	11 46	13 29
64	////	00 44	02 46	08 19	10 03	11 43	13 21
62	////	01 45	03 07	08 25	10 04	11 40	13 13
60	////	02 18	03 24	08 31	10 06	11 38	13 07
N 58	00 41	02 41	03 39	08 35	10 07	11 35	13 02
56	01 36	03 00	03 51	08 39	10 08	11 33	12 57
54	02 06	03 15	04 02	08 43	10 09	11 32	12 52
52	02 28	03 28	04 11	08 46	10 10	11 30	12 48
50	02 45	03 40	04 20	08 50	10 10	11 29	12 45
45	03 18	04 03	04 37	08 56	10 12	11 26	12 37
N 40	03 42	04 21	04 52	09 02	10 14	11 23	12 31
35	04 01	04 36	05 04	09 06	10 15	11 21	12 25
30	04 17	04 48	05 15	09 10	10 16	11 19	12 21
20	04 41	05 09	05 33	09 17	10 18	11 16	12 12
N 10	05 00	05 26	05 48	09 24	10 19	11 13	12 05
0	05 15	05 41	06 03	09 30	10 21	11 10	11 58
S 10	05 29	05 55	06 17	09 35	10 22	11 07	11 52
20	05 42	06 09	06 33	09 42	10 24	11 05	11 45
30	05 55	06 24	06 50	09 49	10 26	11 02	11 37
35	06 02	06 33	07 00	09 53	10 27	11 00	11 32
40	06 09	06 42	07 11	09 57	10 28	10 58	11 27
45	06 17	06 53	07 25	10 03	10 30	10 56	11 21
S 50	06 25	07 05	07 41	10 09	10 32	10 53	11 14
52	06 29	07 11	07 49	10 12	10 32	10 52	11 11
54	06 33	07 17	07 57	10 15	10 33	10 50	11 08
56	06 37	07 24	08 07	10 18	10 34	10 49	11 04
58	06 42	07 31	08 18	10 22	10 35	10 47	10 59
S 60	06 47	07 40	08 30	10 27	10 36	10 45	10 55

Lat.	Ocaso Sol	Crepúsculo Civil	Crepúsculo Náutico	Ocaso Luna 24	Ocaso Luna 25	Ocaso Luna 26	Ocaso Luna 27
°	h m	h m	h m	h m	h m	h m	h m
N 72	▭	▭	▭	22 55	22 34	22 12	21 47
N 70	▭	▭	▭	22 49	22 35	22 21	22 05
68	22 32	////	////	22 43	22 36	22 28	22 20
66	21 52	////	////	22 39	22 37	22 34	22 32
64	21 25	23 18	////	22 35	22 37	22 39	22 42
62	21 04	22 24	////	22 32	22 38	22 44	22 50
60	20 47	21 53	////	22 29	22 38	22 48	22 58
N 58	20 33	21 30	23 23	22 27	22 39	22 51	23 04
56	20 21	21 12	22 34	22 24	22 39	22 54	23 10
54	20 10	20 57	22 05	22 22	22 40	22 57	23 15
52	20 01	20 44	21 43	22 20	22 40	22 59	23 20
50	19 52	20 32	21 26	22 18	22 40	23 02	23 24
45	19 35	20 09	20 54	22 15	22 41	23 07	23 33
N 40	19 21	19 51	20 30	22 11	22 42	23 11	23 41
35	19 08	19 37	20 11	22 09	22 42	23 15	23 48
30	18 58	19 24	19 56	22 06	22 43	23 18	23 54
20	18 40	19 04	19 32	22 02	22 43	23 24	24 04
N 10	18 24	18 47	19 13	21 58	22 44	23 29	24 13
0	18 10	18 32	18 57	21 54	22 44	23 33	24 22
S 10	17 56	18 18	18 44	21 50	22 45	23 38	24 30
20	17 41	18 04	18 31	21 46	22 46	23 43	24 39
30	17 23	17 49	18 18	21 42	22 46	23 49	24 50
35	17 13	17 41	18 11	21 39	22 47	23 52	24 56
40	17 02	17 31	18 04	21 36	22 47	23 56	25 03
45	16 49	17 21	17 57	21 33	22 47	24 00	00 00
S 50	16 32	17 09	17 48	21 28	22 48	24 05	00 05
52	16 25	17 03	17 45	21 26	22 48	24 08	00 08
54	16 16	16 57	17 41	21 24	22 48	24 10	00 10
56	16 07	16 50	17 36	21 22	22 49	24 13	00 13
58	15 56	16 42	17 32	21 19	22 49	24 16	00 16
S 60	15 44	16 34	17 27	21 16	22 49	24 20	00 20

Día	SOL E.T. (−) 00h	SOL E.T. (−) 12h	Pas. Mer.	LUNA Pas. Sup.	LUNA Mer. Inf.	Edad	Fase
d	m s	m s	h m	h m	h m	d %	
24	06 29	06 30	12 06	15 42	03 16	04 19	
25	06 30	06 31	12 07	16 33	04 08	05 29	
26	06 31	06 31	12 07	17 22	04 57	06 40	

T.U.	ARIES	VENUS −4.0		MARTE −1.6		JUPITER −2.0		SATURNO +0.2	
d h	A.H.G.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.
	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
27 00	304 44.4	221 29.8	N21 21.2	51 02.4	S26 50.8	211 25.6	N23 08.7	234 15.8	N20 30.2
01	319 46.8	236 29.2	21.4	66 04.6	50.8	226 27.5	08.7	249 18.0	30.2
02	334 49.3	251 28.7	21.7	81 06.8	50.9	241 29.4	08.7	264 20.2	30.3
03	349 51.8	266 28.1 . .	21.9	96 08.9 . .	50.9	256 31.3 . .	08.7	279 22.5 . .	30.3
04	4 54.2	281 27.5	22.2	111 11.1	50.9	271 33.2	08.7	294 24.7	30.3
05	19 56.7	296 26.9	22.4	126 13.3	50.9	286 35.0	08.7	309 26.9	30.3
06	34 59.2	311 26.3	N21 22.6	141 15.5	S26 50.9	301 36.9	N23 08.7	324 29.1	N20 30.4
07	50 01.6	326 25.8	22.9	156 17.7	50.9	316 38.8	08.7	339 31.3	30.4
08	65 04.1	341 25.2	23.1	171 19.8	50.9	331 40.7	08.7	354 33.5	30.4
V 09	80 06.6	356 24.6 . .	23.4	186 22.0 . .	50.9	346 42.6 . .	08.7	9 35.7 . .	30.5
I 10	95 09.0	11 24.0	23.6	201 24.2	50.9	1 44.5	08.6	24 37.9	30.5
E 11	110 11.5	26 23.4	23.9	216 26.4	50.9	16 46.4	08.6	39 40.1	30.5
R 12	125 13.9	41 22.9	N21 24.1	231 28.5	S26 50.9	31 48.3	N23 08.6	54 42.4	N20 30.5
N 13	140 16.4	56 22.3	24.3	246 30.7	51.0	46 50.2	08.6	69 44.6	30.6
E 14	155 18.9	71 21.7	24.6	261 32.9	51.0	61 52.0	08.6	84 46.8	30.6
S 15	170 21.3	86 21.1 . .	24.8	276 35.0 . .	51.0	76 53.9 . .	08.6	99 49.0 . .	30.6
16	185 23.8	101 20.5	25.0	291 37.2	51.0	91 55.8	08.6	114 51.2	30.7
17	200 26.3	116 20.0	25.3	306 39.4	51.0	106 57.7	08.6	129 53.4	30.7
18	215 28.7	131 19.4	N21 25.5	321 41.5	S26 51.0	121 59.6	N23 08.6	144 55.6	N20 30.7
19	230 31.2	146 18.8	25.7	336 43.7	51.0	137 01.5	08.6	159 57.8	30.7
20	245 33.7	161 18.2	26.0	351 45.8	51.0	152 03.4	08.5	175 00.1	30.8
21	260 36.1	176 17.6 . .	26.2	6 48.0 . .	51.0	167 05.3 . .	08.5	190 02.3 . .	30.8
22	275 38.6	191 17.0	26.4	21 50.2	51.0	182 07.2	08.5	205 04.5	30.8
23	290 41.1	206 16.5	26.7	36 52.3	51.1	197 09.0	08.5	220 06.7	30.8
28 00	305 43.5	221 15.9	N21 26.9	51 54.5	S26 51.1	212 10.9	N23 08.5	235 08.9	N20 30.9
01	320 46.0	236 15.3	27.1	66 56.6	51.1	227 12.8	08.5	250 11.1	30.9
02	335 48.4	251 14.7	27.3	81 58.8	51.1	242 14.7	08.5	265 13.3	30.9
03	350 50.9	266 14.1 . .	27.6	97 00.9 . .	51.1	257 16.6 . .	08.5	280 15.6 . .	31.0
04	5 53.4	281 13.5	27.8	112 03.1	51.1	272 18.5	08.5	295 17.8	31.0
05	20 55.8	296 12.9	28.0	127 05.2	51.1	287 20.4	08.5	310 20.0	31.0
06	35 58.3	311 12.3	N21 28.2	142 07.3	S26 51.1	302 22.3	N23 08.4	325 22.2	N20 31.0
07	51 00.8	326 11.8	28.5	157 09.5	51.1	317 24.2	08.4	340 24.4	31.1
S 08	66 03.2	341 11.2	28.7	172 11.6	51.2	332 26.1	08.4	355 26.6	31.1
A 09	81 05.7	356 10.6 . .	28.9	187 13.8 . .	51.2	347 27.9 . .	08.4	10 28.8 . .	31.1
B 10	96 08.2	11 10.0	29.1	202 15.9	51.2	2 29.8	08.4	25 31.1	31.2
A 11	111 10.6	26 09.4	29.3	217 18.0	51.2	17 31.7	08.4	40 33.3	31.2
A 12	126 13.1	41 08.8	N21 29.6	232 20.2	S26 51.2	32 33.6	N23 08.4	55 35.5	N20 31.2
D 13	141 15.5	56 08.2	29.8	247 22.3	51.2	47 35.5	08.4	70 37.7	31.2
O 14	156 18.0	71 07.6	30.0	262 24.4	51.2	62 37.4	08.4	85 39.9	31.3
15	171 20.5	86 07.0 . .	30.2	277 26.6 . .	51.2	77 39.3 . .	08.4	100 42.1 . .	31.3
16	186 22.9	101 06.5	30.4	292 28.7	51.2	92 41.2	08.3	115 44.3	31.3
17	201 25.4	116 05.9	30.6	307 30.8	51.3	107 43.1	08.3	130 46.6	31.3
18	216 27.9	131 05.3	N21 30.8	322 32.9	S26 51.3	122 45.0	N23 08.3	145 48.8	N20 31.4
19	231 30.3	146 04.7	31.1	337 35.1	51.3	137 46.9	08.3	160 51.0	31.4
20	246 32.8	161 04.1	31.3	352 37.2	51.3	152 48.8	08.3	175 53.2	31.4
21	261 35.3	176 03.5 . .	31.5	7 39.3 . .	51.3	167 50.6 . .	08.3	190 55.4 . .	31.5
22	276 37.7	191 02.9	31.7	22 41.4	51.3	182 52.5	08.3	205 57.6	31.5
23	291 40.2	206 02.3	31.9	37 43.5	51.3	197 54.4	08.3	220 59.9	31.5
29 00	306 42.7	221 01.7	N21 32.1	52 45.6	S26 51.3	212 56.3	N23 08.3	236 02.1	N20 31.5
01	321 45.1	236 01.1	32.3	67 47.8	51.4	227 58.2	08.3	251 04.3	31.6
02	336 47.6	251 00.5	32.5	82 49.9	51.4	243 00.1	08.2	266 06.5	31.6
03	351 50.0	265 59.9 . .	32.7	97 52.0 . .	51.4	258 02.0 . .	08.2	281 08.7 . .	31.6
04	6 52.5	280 59.3	32.9	112 54.1	51.4	273 03.9	08.2	296 10.9	31.7
05	21 55.0	295 58.7	33.1	127 56.2	51.4	288 05.8	08.2	311 13.2	31.7
06	36 57.4	310 58.1	N21 33.3	142 58.3	S26 51.4	303 07.7	N23 08.2	326 15.4	N20 31.7
07	51 59.9	325 57.5	33.5	158 00.4	51.4	318 09.6	08.2	341 17.6	31.7
D 08	67 02.4	340 56.9	33.7	173 02.5	51.4	333 11.5	08.2	356 19.8	31.8
O 09	82 04.8	355 56.3 . .	33.9	188 04.6 . .	51.5	348 13.4 . .	08.2	11 22.0 . .	31.8
M 10	97 07.3	10 55.7	34.1	203 06.7	51.5	3 15.2	08.2	26 24.2	31.8
I 11	112 09.8	25 55.1	34.3	218 08.8	51.5	18 17.1	08.1	41 26.5	31.8
N 12	127 12.2	40 54.5	N21 34.5	233 10.9	S26 51.5	33 19.0	N23 08.1	56 28.7	N20 31.9
G 13	142 14.7	55 53.9	34.7	248 13.0	51.5	48 20.9	08.1	71 30.9	31.9
O 14	157 17.2	70 53.3	34.9	263 15.1	51.5	63 22.8	08.1	86 33.1	31.9
15	172 19.6	85 52.7 . .	35.1	278 17.2 . .	51.5	78 24.7 . .	08.1	101 35.3 . .	32.0
16	187 22.1	100 52.1	35.3	293 19.3	51.5	93 26.6	08.1	116 37.6	32.0
17	202 24.5	115 51.5	35.5	308 21.4	51.6	108 28.5	08.1	131 39.8	32.0
18	217 27.0	130 50.9	N21 35.7	323 23.5	S26 51.6	123 30.4	N23 08.1	146 42.0	N20 32.0
19	232 29.5	145 50.3	35.8	338 25.5	51.6	138 32.3	08.1	161 44.2	32.1
20	247 31.9	160 49.7	36.0	353 27.6	51.6	153 34.2	08.0	176 46.4	32.1
21	262 34.4	175 49.1 . .	36.2	8 29.7 . .	51.6	168 36.1 . .	08.0	191 48.6 . .	32.1
22	277 36.9	190 48.5	36.4	23 31.8	51.6	183 38.0	08.0	206 50.9	32.1
23	292 39.3	205 47.9	36.6	38 33.9	51.6	198 39.9	08.0	221 53.1	32.2
	h m								
Pas. Mer.	3 36.5	v −0.6	d 0.2	v 2.1	d 0.0	v 1.9	d 0.0	v 2.2	d 0.0

ESTRELLAS

Nombre	A.H.S.	Dec.
	° ′	° ′
Acamar	315 25.5	S40 17.7
Achernar	335 33.5	S57 13.5
Acrux	173 20.2	S63 06.6
Adhara	255 20.2	S28 58.3
Aldebaran	291 00.3	N16 30.7
Alioth	166 29.0	N55 57.5
Alkaid	153 06.2	N49 18.7
Al Na'ir	27 54.9	S46 57.1
Alnilam	275 56.1	S 1 12.0
Alphard	218 05.6	S 8 39.8
Alphecca	126 18.8	N26 42.9
Alpheratz	357 53.0	N29 05.8
Altair	62 17.0	N 8 52.4
Ankaa	353 24.6	S42 17.7
Antares	112 37.5	S26 26.1
Arcturus	146 04.2	N19 10.7
Atria	107 47.5	S69 02.0
Avior	234 22.5	S59 30.8
Bellatrix	278 42.3	N 6 21.1
Betelgeuse	271 11.7	N 7 24.5
Canopus	264 00.8	S52 41.6
Capella	280 48.6	N45 59.8
Deneb	49 37.4	N45 17.1
Denebola	182 43.4	N14 34.0
Diphda	349 05.1	S17 58.6
Dubhe	194 03.5	N61 44.9
Elnath	278 24.7	N28 36.5
Eltanin	90 50.0	N51 29.5
Enif	33 56.0	N 9 52.9
Fomalhaut	15 33.9	S29 36.8
Gacrux	172 11.7	S57 07.4
Gienah	176 02.1	S17 32.9
Hadar	149 01.3	S60 23.0
Hamal	328 11.3	N23 28.0
Kaus Aust.	83 55.8	S34 23.0
Kochab	137 19.3	N74 09.4
Markab	13 47.4	N15 12.7
Menkar	314 24.9	N 4 05.7
Menkent	148 18.7	S36 22.7
Miaplacidus	221 42.7	S69 43.4
Mirfak	308 54.0	N49 51.7
Nunki	76 09.5	S26 17.7
Peacock	53 33.2	S56 43.8
Pollux	243 39.5	N28 01.4
Procyon	245 09.8	N 5 13.4
Rasalhague	96 14.9	N12 33.7
Regulus	207 53.7	N11 57.8
Rigel	281 21.3	S 8 11.9
Rigil Kent.	140 04.6	S60 50.6
Sabik	102 23.0	S15 43.6
Schedar	349 51.1	N56 32.4
Shaula	96 34.3	S37 06.3
Sirius	258 42.3	S16 43.0
Spica	158 41.2	S11 10.0
Suhail	222 59.8	S43 26.3
Vega	80 44.9	N38 47.3
Zuben'ubi	137 15.7	S16 02.8

	A.H.S.	Pas. Mer.
	° ′	h m
Venus	275 32.4	9 15
Marte	106 10.9	20 29
Júpiter	266 27.4	9 50
Saturno	289 25.4	8 18

T.U.	SOL				LUNA						
	A.H.G.		Dec.		A.H.G.	v	Dec.		d	P.H.	
d h	°	′	°	′	°	′	′	°	′	′	′
27 00	178	22.4	N19	14.7	96	20.4	11.8	S 6	29.6	13.1	58.2
01	193	22.4		14.1	110	51.2	11.7	6	42.7	13.0	58.2
02	208	22.4		13.5	125	21.9	11.8	6	55.7	13.0	58.2
03	223	22.4	. .	13.0	139	52.7	11.8	7	08.7	12.9	58.1
04	238	22.4		12.4	154	23.5	11.8	7	21.6	12.9	58.1
05	253	22.4		11.8	168	54.3	11.8	7	34.5	12.8	58.0
06	268	22.4	N19	11.3	183	25.1	11.8	S 7	47.3	12.8	58.0
07	283	22.4		10.7	197	55.9	11.8	8	00.1	12.7	58.0
V 08	298	22.4		10.1	212	26.7	11.8	8	12.8	12.6	57.9
I 09	313	22.4	. .	09.6	226	57.5	11.8	8	25.4	12.6	57.9
E 10	328	22.4		09.0	241	28.3	11.8	8	38.0	12.5	57.9
R 11	343	22.4		08.4	255	59.1	11.8	8	50.5	12.5	57.9
N 12	358	22.5	N19	07.9	270	29.9	11.9	S 9	03.0	12.4	57.8
E 13	13	22.5		07.3	285	00.8	11.8	9	15.4	12.4	57.8
S 14	28	22.5		06.7	299	31.6	11.8	9	27.8	12.3	57.8
15	43	22.5	. .	06.2	314	02.4	11.8	9	40.1	12.2	57.7
16	58	22.5		05.6	328	33.2	11.8	9	52.3	12.2	57.7
17	73	22.5		05.0	343	04.0	11.8	10	04.5	12.1	57.7
18	88	22.5	N19	04.4	357	34.8	11.8	S10	16.6	12.0	57.6
19	103	22.5		03.9	12	05.6	11.8	10	28.6	12.0	57.6
20	118	22.5		03.3	26	36.4	11.7	10	40.6	11.9	57.6
21	133	22.5	. .	02.7	41	07.1	11.8	10	52.5	11.9	57.5
22	148	22.6		02.1	55	37.9	11.8	11	04.4	11.7	57.5
23	163	22.6		01.6	70	08.7	11.7	11	16.1	11.7	57.5
28 00	178	22.6	N19	01.0	84	39.4	11.8	S11	27.8	11.7	57.4
01	193	22.6	19	00.4	99	10.2	11.7	11	39.5	11.5	57.4
02	208	22.6	18	59.8	113	40.9	11.8	11	51.0	11.5	57.4
03	223	22.6	. .	59.3	128	11.7	11.7	12	02.5	11.5	57.3
04	238	22.6		58.7	142	42.4	11.7	12	14.0	11.3	57.3
05	253	22.6		58.1	157	13.1	11.7	12	25.3	11.3	57.3
06	268	22.6	N18	57.5	171	43.8	11.7	S12	36.6	11.2	57.2
07	283	22.7		56.9	186	14.5	11.6	12	47.8	11.1	57.2
S 08	298	22.7		56.4	200	45.1	11.7	12	58.9	11.1	57.2
A 09	313	22.7	. .	55.8	215	15.8	11.6	13	10.0	10.9	57.1
B 10	328	22.7		55.2	229	46.4	11.6	13	20.9	10.9	57.1
A 11	343	22.7		54.6	244	17.0	11.6	13	31.8	10.8	57.1
D 12	358	22.7	N18	54.0	258	47.6	11.6	S13	42.6	10.8	57.1
O 13	13	22.7		53.4	273	18.2	11.6	13	53.4	10.6	57.0
14	28	22.8		52.9	287	48.8	11.6	14	04.0	10.6	57.0
15	43	22.8	. .	52.3	302	19.4	11.5	14	14.6	10.5	57.0
16	58	22.8		51.7	316	49.9	11.6	14	25.1	10.4	56.9
17	73	22.8		51.1	331	20.5	11.5	14	35.5	10.3	56.9
18	88	22.8	N18	50.5	345	51.0	11.5	S14	45.8	10.3	56.9
19	103	22.8		49.9	0	21.5	11.4	14	56.1	10.2	56.8
20	118	22.9		49.3	14	51.9	11.5	15	06.3	10.0	56.8
21	133	22.9	. .	48.8	29	22.4	11.4	15	16.3	10.0	56.8
22	148	22.9		48.2	43	52.8	11.4	15	26.3	9.9	56.8
23	163	22.9		47.6	58	23.2	11.4	15	36.2	9.8	56.7
29 00	178	22.9	N18	47.0	72	53.6	11.4	S15	46.0	9.8	56.7
01	193	22.9		46.4	87	24.0	11.3	15	55.8	9.6	56.7
02	208	23.0		45.8	101	54.3	11.4	16	05.4	9.6	56.6
03	223	23.0	. .	45.2	116	24.7	11.3	16	15.0	9.4	56.6
04	238	23.0		44.6	130	55.0	11.3	16	24.4	9.4	56.6
05	253	23.0		44.0	145	25.3	11.2	16	33.8	9.3	56.6
06	268	23.0	N18	43.4	159	55.5	11.3	S16	43.1	9.2	56.5
07	283	23.1		42.8	174	25.8	11.2	16	52.3	9.1	56.5
D 08	298	23.1		42.3	188	56.0	11.2	17	01.4	9.0	56.5
O 09	313	23.1	. .	41.7	203	26.2	11.2	17	10.4	8.9	56.4
M 10	328	23.1		41.1	217	56.4	11.1	17	19.3	8.8	56.4
I 11	343	23.1		40.5	232	26.5	11.2	17	28.1	8.7	56.4
N 12	358	23.2	N18	39.9	246	56.7	11.1	S17	36.8	8.6	56.4
G 13	13	23.2		39.3	261	26.8	11.1	17	45.4	8.5	56.3
O 14	28	23.2		38.7	275	56.9	11.0	17	53.9	8.5	56.3
15	43	23.2	. .	38.1	290	26.9	11.1	18	02.4	8.3	56.3
16	58	23.3		37.5	304	57.0	11.0	18	10.7	8.2	56.3
17	73	23.3		36.9	319	27.0	11.0	18	18.9	8.2	56.2
18	88	23.3	N18	36.3	333	57.0	11.0	S18	27.1	8.0	56.2
19	103	23.3		35.7	348	27.0	10.9	18	35.1	7.9	56.2
20	118	23.3		35.1	2	56.9	11.0	18	43.0	7.9	56.1
21	133	23.4	. .	34.5	17	26.9	10.9	18	50.9	7.7	56.1
22	148	23.4		33.9	31	56.8	10.9	18	58.6	7.7	56.1
23	163	23.4		33.3	46	26.7	10.8	S19	06.3	7.5	56.1
	SD	15.8	d	0.6	SD	15.8		15.5			15.4

Lat.	Crepúsculo Náutico	Crepúsculo Civil	Orto Sol	Orto Luna 27	Orto Luna 28	Orto Luna 29	Orto Luna 30
°	h m	h m	h m	h m	h m	h m	h m
N 72	▭	▭	▭	14 08	16 27	▬	▬
N 70	////	////	00 36	13 52	15 54	18 15	▬
68	////	////	01 53	13 39	15 30	17 27	19 42
66	////	////	02 30	13 29	15 12	16 56	18 40
64	////	01 13	02 55	13 21	14 57	16 33	18 05
62	////	01 58	03 15	13 13	14 45	16 15	17 40
60	////	02 27	03 31	13 07	14 35	16 00	17 21
N 58	01 06	02 49	03 45	13 02	14 26	15 47	17 04
56	01 48	03 06	03 56	12 57	14 18	15 37	16 51
54	02 15	03 21	04 07	12 52	14 11	15 27	16 39
52	02 35	03 33	04 16	12 48	14 05	15 18	16 28
50	02 51	03 44	04 24	12 45	13 59	15 11	16 19
45	03 23	04 06	04 41	12 37	13 47	14 55	16 00
N 40	03 46	04 24	04 55	12 31	13 37	14 42	15 44
35	04 04	04 38	05 06	12 25	13 28	14 30	15 30
30	04 19	04 50	05 17	12 21	13 21	14 21	15 19
20	04 42	05 10	05 34	12 12	13 08	14 04	14 59
N 10	05 01	05 27	05 49	12 05	12 57	13 49	14 42
0	05 16	05 41	06 03	11 58	12 47	13 36	14 26
S 10	05 29	05 55	06 17	11 52	12 37	13 22	14 10
20	05 41	06 08	06 31	11 45	12 26	13 08	13 53
30	05 54	06 23	06 48	11 37	12 13	12 52	13 34
35	06 00	06 31	06 58	11 32	12 06	12 43	13 22
40	06 07	06 40	07 09	11 27	11 58	12 32	13 09
45	06 14	06 50	07 22	11 21	11 49	12 19	12 54
S 50	06 22	07 01	07 37	11 14	11 38	12 04	12 36
52	06 25	07 07	07 44	11 11	11 32	11 57	12 27
54	06 29	07 13	07 52	11 08	11 27	11 49	12 17
56	06 33	07 19	08 02	11 04	11 20	11 41	12 06
58	06 37	07 26	08 12	10 59	11 13	11 31	11 54
S 60	06 42	07 34	08 24	10 55	11 06	11 20	11 39

Lat.	Ocaso Sol	Crepúsculo Civil	Crepúsculo Náutico	Ocaso Luna 27	Ocaso Luna 28	Ocaso Luna 29	Ocaso Luna 30
°	h m	h m	h m	h m	h m	h m	h m
N 72	▭	▭	▭	21 47	21 10	▬	▬
N 70	23 20	////	////	22 05	21 45	21 07	▬
68	22 15	////	////	22 20	22 10	21 56	21 25
66	21 40	////	////	22 32	22 30	22 28	22 29
64	21 15	22 53	////	22 42	22 45	22 52	23 04
62	20 56	22 11	////	22 50	22 58	23 10	23 29
60	20 40	21 43	////	22 58	23 10	23 26	23 49
N 58	20 27	21 22	23 01	23 04	23 19	23 39	24 06
56	20 15	21 05	22 22	23 10	23 28	23 51	24 20
54	20 05	20 51	21 56	23 15	23 36	24 01	00 01
52	19 56	20 38	21 36	23 20	23 43	24 09	00 09
50	19 48	20 28	21 20	23 24	23 49	24 18	00 18
45	19 32	20 06	20 49	23 33	24 02	00 02	00 35
N 40	19 18	19 48	20 26	23 41	24 13	00 13	00 49
35	19 06	19 34	20 08	23 48	24 23	00 23	01 01
30	18 56	19 22	19 54	23 54	24 31	00 31	01 11
20	18 39	19 02	19 30	24 04	00 04	00 46	01 29
N 10	18 24	18 46	19 12	24 13	00 13	00 58	01 45
0	18 10	18 32	18 57	24 22	00 22	01 10	02 00
S 10	17 56	18 18	18 44	24 30	00 30	01 22	02 15
20	17 42	18 05	18 32	24 39	00 39	01 35	02 30
30	17 25	17 51	18 19	24 50	00 50	01 50	02 49
35	17 16	17 43	18 13	24 56	00 56	01 58	02 59
40	17 05	17 34	18 07	25 03	01 03	02 08	03 12
45	16 52	17 24	17 59	00 00	01 11	02 20	03 26
S 50	16 36	17 12	17 52	00 05	01 20	02 34	03 44
52	16 29	17 07	17 48	00 08	01 25	02 40	03 52
54	16 21	17 01	17 44	00 10	01 30	02 47	04 02
56	16 12	16 55	17 40	00 13	01 35	02 56	04 12
58	16 02	16 47	17 36	00 16	01 42	03 05	04 24
S 60	15 50	16 39	17 32	00 20	01 49	03 15	04 39

Día	SOL E.T. (−) 00h	SOL E.T. (−) 12h	SOL Pas. Mer.	LUNA Pas. Sup.	LUNA Mer. Inf.	LUNA Edad	LUNA Fase
d	m s	m s	h m	h m	h m	d	%
27	06 31	06 30	12 07	18 10	05 46	07	51
28	06 30	06 29	12 06	18 59	06 34	08	62
29	06 28	06 27	12 06	19 48	07 23	09	71

T.U.	ARIES	VENUS −4.0		MARTE −1.5		JUPITER −2.0		SATURNO +0.2	
d h	A.H.G.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.
	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
30 00	307 41.8	220 47.3	N21 36.8	53 36.0	S26 51.6	213 41.8	N23 08.0	236 55.3	N20 32.2
01	322 44.3	235 46.7	37.0	68 38.0	51.7	228 43.7	08.0	251 57.5	32.2
02	337 46.7	250 46.1	37.1	83 40.1	51.7	243 45.6	08.0	266 59.7	32.2
03	352 49.2	265 45.5	. . 37.3	98 42.2	. . 51.7	258 47.5	. . 08.0	282 02.0	. . 32.3
04	7 51.7	280 44.9	37.5	113 44.3	51.7	273 49.3	08.0	297 04.2	32.3
05	22 54.1	295 44.3	37.7	128 46.3	51.7	288 51.2	07.9	312 06.4	32.3
06	37 56.6	310 43.7	N21 37.9	143 48.4	S26 51.7	303 53.1	N23 07.9	327 08.6	N20 32.4
07	52 59.0	325 43.1	38.0	158 50.5	51.7	318 55.0	07.9	342 10.8	32.4
L 08	68 01.5	340 42.5	38.2	173 52.5	51.8	333 56.9	07.9	357 13.1	32.4
09	83 04.0	355 41.9	. . 38.4	188 54.6	. . 51.8	348 58.8	. . 07.9	12 15.3	. . 32.4
U 10	98 06.4	10 41.3	38.6	203 56.7	51.8	4 00.7	07.9	27 17.5	32.5
11	113 08.9	25 40.7	38.7	218 58.7	51.8	19 02.6	07.9	42 19.7	32.5
N 12	128 11.4	40 40.1	N21 38.9	234 00.8	S26 51.8	34 04.5	N23 07.9	57 21.9	N20 32.5
E 13	143 13.8	55 39.5	39.1	249 02.8	51.8	49 06.4	07.8	72 24.2	32.5
14	158 16.3	70 38.9	39.3	264 04.9	51.8	64 08.3	07.8	87 26.4	32.6
S 15	173 18.8	85 38.2	. . 39.4	279 07.0	. . 51.8	79 10.2	. . 07.8	102 28.6	. . 32.6
16	188 21.2	100 37.6	39.6	294 09.0	51.9	94 12.1	07.8	117 30.8	32.6
17	203 23.7	115 37.0	39.8	309 11.1	51.9	109 14.0	07.8	132 33.1	32.6
18	218 26.1	130 36.4	N21 39.9	324 13.1	S26 51.9	124 15.9	N23 07.8	147 35.3	N20 32.7
19	233 28.6	145 35.8	40.1	339 15.2	51.9	139 17.8	07.8	162 37.5	32.7
20	248 31.1	160 35.2	40.3	354 17.2	51.9	154 19.7	07.8	177 39.7	32.7
21	263 33.5	175 34.6	. . 40.4	9 19.3	. . 51.9	169 21.6	. . 07.8	192 41.9	. . 32.8
22	278 36.0	190 34.0	40.6	24 21.3	51.9	184 23.5	07.7	207 44.2	32.8
23	293 38.5	205 33.4	40.8	39 23.3	52.0	199 25.4	07.7	222 46.4	32.8
31 00	308 40.9	220 32.8	N21 40.9	54 25.4	S26 52.0	214 27.3	N23 07.7	237 48.6	N20 32.8
01	323 43.4	235 32.1	41.1	69 27.4	52.0	229 29.2	07.7	252 50.8	32.9
02	338 45.9	250 31.5	41.2	84 29.5	52.0	244 31.1	07.7	267 53.1	32.9
03	353 48.3	265 30.9	. . 41.4	99 31.5	. . 52.0	259 33.0	. . 07.7	282 55.3	. . 32.9
04	8 50.8	280 30.3	41.6	114 33.5	52.0	274 34.9	07.7	297 57.5	32.9
05	23 53.3	295 29.7	41.7	129 35.6	52.1	289 36.8	07.7	312 59.7	33.0
06	38 55.7	310 29.1	N21 41.9	144 37.6	S26 52.1	304 38.7	N23 07.6	328 01.9	N20 33.0
07	53 58.2	325 28.5	42.0	159 39.6	52.1	319 40.6	07.6	343 04.2	33.0
M 08	69 00.6	340 27.9	42.2	174 41.7	52.1	334 42.5	07.6	358 06.4	33.0
A 09	84 03.1	355 27.2	. . 42.3	189 43.7	. . 52.1	349 44.4	. . 07.6	13 08.6	. . 33.1
R 10	99 05.6	10 26.6	42.5	204 45.7	52.1	4 46.3	07.6	28 10.8	33.1
11	114 08.0	25 26.0	42.6	219 47.8	52.1	19 48.2	07.6	43 13.1	33.1
T 12	129 10.5	40 25.4	N21 42.8	234 49.8	S26 52.2	34 50.0	N23 07.6	58 15.3	N20 33.1
E 13	144 13.0	55 24.8	42.9	249 51.8	52.2	49 51.9	07.6	73 17.5	33.2
14	159 15.4	70 24.2	43.1	264 53.8	52.2	64 53.8	07.5	88 19.7	33.2
S 15	174 17.9	85 23.5	. . 43.2	279 55.9	. . 52.2	79 55.7	. . 07.5	103 22.0	. . 33.2
16	189 20.4	100 22.9	43.4	294 57.9	52.2	94 57.6	07.5	118 24.2	33.3
17	204 22.8	115 22.3	43.5	309 59.9	52.2	109 59.5	07.5	133 26.4	33.3
18	219 25.3	130 21.7	N21 43.7	325 01.9	S26 52.2	125 01.4	N23 07.5	148 28.6	N20 33.3
19	234 27.8	145 21.1	43.8	340 03.9	52.3	140 03.3	07.5	163 30.9	33.3
20	249 30.2	160 20.5	44.0	355 05.9	52.3	155 05.2	07.5	178 33.1	33.4
21	264 32.7	175 19.8	. . 44.1	10 08.0	. . 52.3	170 07.1	. . 07.5	193 35.3	. . 33.4
22	279 35.1	190 19.2	44.2	25 10.0	52.3	185 09.0	07.4	208 37.5	33.4
23	294 37.6	205 18.6	44.4	40 12.0	52.3	200 10.9	07.4	223 39.8	33.4
1 00	309 40.1	220 18.0	N21 44.5	55 14.0	S26 52.3	215 12.8	N23 07.4	238 42.0	N20 33.5
01	324 42.5	235 17.4	44.7	70 16.0	52.4	230 14.7	07.4	253 44.2	33.5
02	339 45.0	250 16.8	44.8	85 18.0	52.4	245 16.6	07.4	268 46.4	33.5
03	354 47.5	265 16.1	. . 44.9	100 20.0	. . 52.4	260 18.5	. . 07.4	283 48.7	. . 33.5
04	9 49.9	280 15.5	45.1	115 22.0	52.4	275 20.4	07.4	298 50.9	33.6
05	24 52.4	295 14.9	45.2	130 24.0	52.4	290 22.3	07.4	313 53.1	33.6
06	39 54.9	310 14.3	N21 45.3	145 26.0	S26 52.4	305 24.2	N23 07.3	328 55.3	N20 33.6
M 07	54 57.3	325 13.6	45.5	160 28.0	52.5	320 26.1	07.3	343 57.6	33.6
I 08	69 59.8	340 13.0	45.6	175 30.0	52.5	335 28.0	07.3	358 59.8	33.7
E 09	85 02.3	355 12.4	. . 45.7	190 32.0	. . 52.5	350 29.9	. . 07.3	14 02.0	. . 33.7
R 10	100 04.7	10 11.8	45.9	205 34.0	52.5	5 31.8	07.3	29 04.2	33.7
C 11	115 07.2	25 11.2	46.0	220 36.0	52.5	20 33.8	07.3	44 06.5	33.7
O 12	130 09.6	40 10.5	N21 46.1	235 38.0	S26 52.5	35 35.7	N23 07.3	59 08.7	N20 33.8
L 13	145 12.1	55 09.9	46.2	250 39.9	52.6	50 37.6	07.2	74 10.9	33.8
E 14	160 14.6	70 09.3	46.4	265 41.9	52.6	65 39.5	07.2	89 13.2	33.8
S 15	175 17.0	85 08.7	. . 46.5	280 43.9	. . 52.6	80 41.4	. . 07.2	104 15.4	. . 33.8
16	190 19.5	100 08.0	46.6	295 45.9	52.6	95 43.3	07.2	119 17.6	33.9
17	205 22.0	115 07.4	46.7	310 47.9	52.6	110 45.2	07.2	134 19.8	33.9
18	220 24.4	130 06.8	N21 46.9	325 49.9	S26 52.6	125 47.1	N23 07.2	149 22.1	N20 33.9
19	235 26.9	145 06.2	47.0	340 51.8	52.7	140 49.0	07.2	164 24.3	33.9
20	250 29.4	160 05.5	47.1	355 53.8	52.7	155 50.9	07.2	179 26.5	34.0
21	265 31.8	175 04.9	. . 47.2	10 55.8	. . 52.7	170 52.8	. . 07.1	194 28.7	. . 34.0
22	280 34.3	190 04.3	47.3	25 57.8	52.7	185 54.7	07.1	209 31.0	34.0
23	295 36.8	205 03.7	47.4	40 59.8	52.7	200 56.6	07.1	224 33.2	34.0
	h m								
Pas. Mer.	3 24.7	*v* −0.6	*d* 0.1	*v* 2.0	*d* 0.0	*v* 1.9	*d* 0.0	*v* 2.2	*d* 0.0

ESTRELLAS

Nombre	A.H.S.	Dec.
	° ′	° ′
Acamar	315 25.4	S40 17.7
Achernar	335 33.5	S57 13.5
Acrux	173 20.2	S63 06.6
Adhara	255 20.2	S28 58.3
Aldebaran	291 00.3	N16 30.7
Alioth	166 29.0	N55 57.5
Alkaid	153 06.2	N49 18.7
Al Na'ir	27 54.9	S46 57.1
Alnilam	275 56.1	S 1 12.0
Alphard	218 05.6	S 8 39.8
Alphecca	126 18.8	N26 42.9
Alpheratz	357 53.0	N29 05.8
Altair	62 17.0	N 8 52.4
Ankaa	353 24.6	S42 17.7
Antares	112 37.5	S26 26.1
Arcturus	146 04.2	N19 10.7
Atria	107 47.5	S69 02.0
Avior	234 22.5	S59 30.8
Bellatrix	278 42.3	N 6 21.1
Betelgeuse	271 11.7	N 7 24.5
Canopus	264 00.8	S52 41.6
Capella	280 48.6	N45 59.8
Deneb	49 37.4	N45 17.1
Denebola	182 43.4	N14 34.0
Diphda	349 05.1	S17 58.6
Dubhe	194 03.5	N61 44.9
Elnath	278 24.7	N28 36.5
Eltanin	90 50.1	N51 29.6
Enif	33 56.0	N 9 52.9
Fomalhaut	15 33.9	S29 36.8
Gacrux	172 11.7	S57 07.4
Gienah	176 02.1	S17 32.9
Hadar	149 01.3	S60 23.0
Hamal	328 11.3	N23 28.0
Kaus Aust.	83 55.8	S34 23.0
Kochab	137 19.4	N74 09.4
Markab	13 47.4	N15 12.8
Menkar	314 24.9	N 4 05.7
Menkent	148 18.7	S36 22.7
Miaplacidus	221 42.7	S69 43.4
Mirfak	308 53.9	N49 51.7
Nunki	76 09.5	S26 17.7
Peacock	53 33.2	S56 43.8
Pollux	243 39.5	N28 01.4
Procyon	245 09.8	N 5 13.4
Rasalhague	96 14.9	N12 33.7
Regulus	207 53.7	N11 57.8
Rigel	281 21.2	S 8 11.9
Rigil Kent.	140 04.7	S60 50.6
Sabik	102 23.0	S15 43.6
Schedar	349 51.0	N56 32.5
Shaula	96 34.3	S37 06.3
Sirius	258 42.3	S16 43.0
Spica	158 41.2	S11 10.0
Suhail	222 59.8	S43 26.3
Vega	80 44.9	N38 47.3
Zuben'ubi	137 15.7	S16 02.8

	A.H.S.	Pas. Mer.
	° ′	h m
Venus	271 51.8	9 18
Marte	105 44.5	20 20
Júpiter	265 46.3	9 41
Saturno	289 07.7	8 08

T.U.	SOL				LUNA						
	A.H.G.		Dec.		A.H.G.		v	Dec.		d	P.H.
d h	°	′	°	′	°	′	′	°	′	′	′
30 00	178	23.4	N18	32.7	60	56.5	10.9	S19	13.8	7.4	56.0
01	193	23.5		32.1	75	26.4	10.8	19	21.2	7.3	56.0
02	208	23.5		31.5	89	56.2	10.8	19	28.5	7.3	56.0
03	223	23.5	. .	30.9	104	26.0	10.7	19	35.8	7.1	56.0
04	238	23.5		30.3	118	55.7	10.8	19	42.9	7.0	55.9
05	253	23.6		29.7	133	25.5	10.7	19	49.9	6.9	55.9
06	268	23.6	N18	29.1	147	55.2	10.7	S19	56.8	6.8	55.9
07	283	23.6		28.5	162	24.9	10.7	20	03.6	6.7	55.9
08	298	23.6		27.8	176	54.6	10.7	20	10.3	6.6	55.8
L 09	313	23.7	. .	27.2	191	24.3	10.6	20	16.9	6.5	55.8
U 10	328	23.7		26.6	205	53.9	10.7	20	23.4	6.4	55.8
N 11	343	23.7		26.0	220	23.6	10.6	20	29.8	6.2	55.8
E 12	358	23.8	N18	25.4	234	53.2	10.5	S20	36.0	6.2	55.8
S 13	13	23.8		24.8	249	22.7	10.6	20	42.2	6.0	55.7
14	28	23.8		24.2	263	52.3	10.6	20	48.2	6.0	55.7
15	43	23.8	. .	23.6	278	21.9	10.5	20	54.2	5.8	55.7
16	58	23.9		23.0	292	51.4	10.5	21	00.0	5.7	55.7
17	73	23.9		22.4	307	20.9	10.5	21	05.7	5.6	55.6
18	88	23.9	N18	21.8	321	50.4	10.5	S21	11.3	5.5	55.6
19	103	24.0		21.1	336	19.9	10.4	21	16.8	5.4	55.6
20	118	24.0		20.5	350	49.3	10.5	21	22.2	5.3	55.6
21	133	24.0	. .	19.9	5	18.8	10.4	21	27.5	5.2	55.5
22	148	24.0		19.3	19	48.2	10.4	21	32.7	5.0	55.5
23	163	24.1		18.7	34	17.6	10.4	21	37.7	5.0	55.5
31 00	178	24.1	N18	18.1	48	47.0	10.4	S21	42.7	4.8	55.5
01	193	24.1		17.5	63	16.4	10.3	21	47.5	4.7	55.5
02	208	24.2		16.8	77	45.7	10.4	21	52.2	4.6	55.4
03	223	24.2	. .	16.2	92	15.1	10.3	21	56.8	4.5	55.4
04	238	24.2		15.6	106	44.4	10.3	22	01.3	4.4	55.4
05	253	24.3		15.0	121	13.7	10.4	22	05.7	4.2	55.4
06	268	24.3	N18	14.4	135	43.1	10.3	S22	09.9	4.2	55.4
07	283	24.3		13.8	150	12.4	10.3	22	14.1	4.0	55.3
M 08	298	24.4		13.1	164	41.7	10.2	22	18.1	3.9	55.3
A 09	313	24.4	. .	12.5	179	10.9	10.3	22	22.0	3.8	55.3
R 10	328	24.4		11.9	193	40.2	10.3	22	25.8	3.7	55.3
T 11	343	24.5		11.3	208	09.5	10.2	22	29.5	3.6	55.3
E 12	358	24.5	N18	10.7	222	38.7	10.3	S22	33.1	3.4	55.2
S 13	13	24.5		10.0	237	08.0	10.2	22	36.5	3.4	55.2
14	28	24.6		09.4	251	37.2	10.3	22	39.9	3.2	55.2
15	43	24.6	. .	08.8	266	06.5	10.2	22	43.1	3.1	55.2
16	58	24.6		08.2	280	35.7	10.2	22	46.2	3.0	55.2
17	73	24.7		07.6	295	04.9	10.2	22	49.2	2.8	55.1
18	88	24.7	N18	06.9	309	34.1	10.3	S22	52.0	2.8	55.1
19	103	24.7		06.3	324	03.4	10.2	22	54.8	2.6	55.1
20	118	24.8		05.7	338	32.6	10.2	22	57.4	2.5	55.1
21	133	24.8	. .	05.1	353	01.8	10.2	22	59.9	2.4	55.1
22	148	24.9		04.4	7	31.0	10.2	23	02.3	2.3	55.1
23	163	24.9		03.8	22	00.2	10.2	23	04.6	2.2	55.0
1 00	178	24.9	N18	03.2	36	29.4	10.2	S23	06.8	2.0	55.0
01	193	25.0		02.5	50	58.6	10.3	23	08.8	2.0	55.0
02	208	25.0		01.9	65	27.9	10.2	23	10.8	1.8	55.0
03	223	25.0	. .	01.3	79	57.1	10.2	23	12.6	1.7	55.0
04	238	25.1		00.7	94	26.3	10.2	23	14.3	1.5	54.9
05	253	25.1	18	00.0	108	55.5	10.3	23	15.8	1.5	54.9
06	268	25.2	N17	59.4	123	24.8	10.2	S23	17.3	1.3	54.9
M 07	283	25.2		58.8	137	54.0	10.3	23	18.6	1.3	54.9
I 08	298	25.2		58.1	152	23.3	10.2	23	19.9	1.1	54.9
E 09	313	25.3	. .	57.5	166	52.5	10.3	23	21.0	1.0	54.9
R 10	328	25.3		56.9	181	21.8	10.2	23	22.0	0.8	54.8
C 11	343	25.4		56.2	195	51.0	10.3	23	22.8	0.8	54.8
O 12	358	25.4	N17	55.6	210	20.3	10.3	S23	23.6	0.6	54.8
L 13	13	25.4		55.0	224	49.6	10.3	23	24.2	0.6	54.8
E 14	28	25.5		54.3	239	18.9	10.3	23	24.8	0.4	54.8
S 15	43	25.5	. .	53.7	253	48.2	10.4	23	25.2	0.2	54.8
16	58	25.6		53.1	268	17.6	10.3	23	25.4	0.2	54.8
17	73	25.6		52.4	282	46.9	10.4	23	25.6	0.1	54.7
18	88	25.6	N17	51.8	297	16.3	10.3	S23	25.7	0.1	54.7
19	103	25.7		51.2	311	45.6	10.4	23	25.6	0.2	54.7
20	118	25.7		50.5	326	15.0	10.4	23	25.4	0.3	54.7
21	133	25.8	. .	49.9	340	44.4	10.5	23	25.1	0.4	54.7
22	148	25.8		49.3	355	13.9	10.4	23	24.7	0.5	54.7
23	163	25.9		48.6	9	43.3	10.5	S23	24.2	0.6	54.7
	SD	15.8	d	0.6	SD	15.2		15.1		14.9	

Lat.	Crepúsculo Náutico	Crepúsculo Civil	Orto Sol	Orto Luna 30	Orto Luna 31	Orto Luna 1	Orto Luna 2
°	h m	h m	h m	h m	h m	h m	h m
N 72	▭	▭	▭	▬	▬	▬	▬
N 70	////	////	01 17	▬	▬	▬	▬
68	////	////	02 10	19 42	▬	▬	▬
66	////	////	02 42	18 40	20 19	21 29	21 50
64	////	01 34	03 05	18 05	19 27	20 29	21 04
62	////	02 11	03 23	17 40	18 56	19 55	20 34
60	////	02 37	03 38	17 21	18 32	19 30	20 12
N 58	01 25	02 57	03 51	17 04	18 13	19 10	19 53
56	01 59	03 13	04 02	16 51	17 57	18 54	19 38
54	02 23	03 27	04 12	16 39	17 44	18 40	19 25
52	02 42	03 39	04 20	16 28	17 32	18 27	19 13
50	02 57	03 49	04 28	16 19	17 22	18 17	19 03
45	03 27	04 10	04 44	16 00	17 00	17 54	18 41
N 40	03 49	04 27	04 57	15 44	16 42	17 36	18 24
35	04 07	04 41	05 09	15 30	16 28	17 21	18 09
30	04 21	04 52	05 18	15 19	16 15	17 08	17 56
20	04 44	05 12	05 35	14 59	15 53	16 45	17 34
N 10	05 01	05 27	05 49	14 42	15 34	16 26	17 16
0	05 16	05 41	06 03	14 26	15 17	16 08	16 58
S 10	05 29	05 54	06 16	14 10	14 59	15 49	16 40
20	05 40	06 07	06 30	13 53	14 40	15 30	16 21
30	05 52	06 21	06 46	13 34	14 19	15 08	15 59
35	05 58	06 28	06 55	13 22	14 06	14 55	15 46
40	06 04	06 37	07 06	13 09	13 52	14 39	15 32
45	06 11	06 46	07 18	12 54	13 35	14 21	15 14
S 50	06 18	06 58	07 33	12 36	13 14	13 59	14 52
52	06 22	07 03	07 40	12 27	13 04	13 49	14 42
54	06 25	07 08	07 47	12 17	12 52	13 37	14 30
56	06 29	07 14	07 56	12 06	12 39	13 23	14 17
58	06 33	07 21	08 06	11 54	12 25	13 07	14 01
S 60	06 37	07 28	08 17	11 39	12 07	12 47	13 42

Lat.	Ocaso Sol	Crepúsculo Civil	Crepúsculo Náutico	Ocaso Luna 30	Ocaso Luna 31	Ocaso Luna 1	Ocaso Luna 2
°	h m	h m	h m	h m	h m	h m	h m
N 72	▭	▭	▭	▬	▬	▬	▬
N 70	22 47	////	////	▬	▬	▬	▬
68	21 59	////	////	21 25	▬	▬	▬
66	21 28	////	////	22 29	22 35	23 11	24 35
64	21 05	22 34	////	23 04	23 27	24 12	00 12
62	20 48	21 58	////	23 29	23 59	24 46	00 46
60	20 33	21 33	////	23 49	24 23	00 23	01 10
N 58	20 20	21 14	22 43	24 06	00 06	00 42	01 30
56	20 09	20 58	22 10	24 20	00 20	00 58	01 46
54	20 00	20 45	21 47	00 01	00 32	01 11	02 00
52	19 52	20 33	21 29	00 09	00 42	01 23	02 13
50	19 44	20 23	21 14	00 18	00 52	01 34	02 23
45	19 28	20 02	20 44	00 35	01 12	01 56	02 46
N 40	19 15	19 45	20 22	00 49	01 29	02 14	03 04
35	19 04	19 32	20 05	01 01	01 43	02 29	03 19
30	18 54	19 20	19 51	01 11	01 55	02 42	03 32
20	18 37	19 01	19 29	01 29	02 15	03 04	03 55
N 10	18 23	18 45	19 11	01 45	02 33	03 23	04 14
0	18 10	18 32	18 57	02 00	02 50	03 41	04 32
S 10	17 57	18 19	18 44	02 15	03 07	03 59	04 50
20	17 43	18 06	18 32	02 30	03 25	04 18	05 09
30	17 27	17 52	18 21	02 49	03 46	04 41	05 31
35	17 18	17 45	18 15	02 59	03 58	04 54	05 44
40	17 07	17 36	18 09	03 12	04 12	05 09	05 59
45	16 55	17 27	18 02	03 26	04 29	05 26	06 17
S 50	16 40	17 16	17 55	03 44	04 50	05 49	06 39
52	16 33	17 11	17 52	03 52	04 59	05 59	06 50
54	16 26	17 05	17 48	04 02	05 10	06 11	07 02
56	16 17	16 59	17 45	04 12	05 23	06 25	07 15
58	16 08	16 53	17 41	04 24	05 38	06 41	07 31
S 60	15 57	16 45	17 37	04 39	05 55	07 00	07 50

Día	SOL E.T. (−) 00h	SOL E.T. (−) 12h	SOL Pas. Mer.	LUNA Pas. Sup.	LUNA Mer. Inf.	LUNA Edad	LUNA Fase
d	m s	m s	h m	h m	h m	d	%
30	06 26	06 25	12 06	20 38	08 13	10	80
31	06 24	06 22	12 06	21 29	09 03	11	87
1	06 20	06 18	12 06	22 20	09 54	12	93

T.U.	ARIES	VENUS −4.0		MARTE −1.4		JUPITER −2.0		SATURNO +0.2	
	A.H.G.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
2 00	310 39.2	220 03.0	N21 47.6	56 01.7	S26 52.7	215 58.5	N23 07.1	239 35.4	N20 34.1
01	325 41.7	235 02.4	47.7	71 03.7	52.8	231 00.4	07.1	254 37.7	34.1
02	340 44.1	250 01.8	47.8	86 05.7	52.8	246 02.3	07.1	269 39.9	34.1
03	355 46.6	265 01.2	47.9	101 07.6	52.8	261 04.2	07.1	284 42.1	34.1
04	10 49.1	280 00.5	48.0	116 09.6	52.8	276 06.1	07.0	299 44.3	34.2
05	25 51.5	294 59.9	48.1	131 11.6	52.8	291 08.0	07.0	314 46.6	34.2
06	40 54.0	309 59.3	N21 48.2	146 13.5	S26 52.8	306 09.9	N23 07.0	329 48.8	N20 34.2
07	55 56.5	324 58.6	48.3	161 15.5	52.9	321 11.8	07.0	344 51.0	34.2
J 08	70 58.9	339 58.0	48.5	176 17.5	52.9	336 13.7	07.0	359 53.3	34.3
U 09	86 01.4	354 57.4	48.6	191 19.4	52.9	351 15.6	07.0	14 55.5	34.3
E 10	101 03.9	9 56.8	48.7	206 21.4	52.9	6 17.5	07.0	29 57.7	34.3
V 11	116 06.3	24 56.1	48.8	221 23.3	52.9	21 19.4	06.9	45 00.0	34.3
12	131 08.8	39 55.5	N21 48.9	236 25.3	S26 52.9	36 21.3	N23 06.9	60 02.2	N20 34.4
E 13	146 11.2	54 54.9	49.0	251 27.2	53.0	51 23.2	06.9	75 04.4	34.4
14	161 13.7	69 54.2	49.1	266 29.2	53.0	66 25.1	06.9	90 06.6	34.4
S 15	176 16.2	84 53.6	49.2	281 31.1	53.0	81 27.0	06.9	105 08.9	34.4
16	191 18.6	99 53.0	49.3	296 33.1	53.0	96 28.9	06.9	120 11.1	34.5
17	206 21.1	114 52.3	49.4	311 35.0	53.0	111 30.8	06.9	135 13.3	34.5
18	221 23.6	129 51.7	N21 49.5	326 37.0	S26 53.0	126 32.7	N23 06.9	150 15.6	N20 34.5
19	236 26.0	144 51.1	49.6	341 38.9	53.1	141 34.7	06.8	165 17.8	34.5
20	251 28.5	159 50.5	49.7	356 40.9	53.1	156 36.6	06.8	180 20.0	34.6
21	266 31.0	174 49.8	49.8	11 42.8	53.1	171 38.5	06.8	195 22.3	34.6
22	281 33.4	189 49.2	49.9	26 44.8	53.1	186 40.4	06.8	210 24.5	34.6
23	296 35.9	204 48.6	50.0	41 46.7	53.1	201 42.3	06.8	225 26.7	34.6
3 00	311 38.4	219 47.9	N21 50.1	56 48.6	S26 53.2	216 44.2	N23 06.8	240 29.0	N20 34.7
01	326 40.8	234 47.3	50.1	71 50.6	53.2	231 46.1	06.8	255 31.2	34.7
02	341 43.3	249 46.7	50.2	86 52.5	53.2	246 48.0	06.7	270 33.4	34.7
03	356 45.7	264 46.0	50.3	101 54.5	53.2	261 49.9	06.7	285 35.6	34.7
04	11 48.2	279 45.4	50.4	116 56.4	53.2	276 51.8	06.7	300 37.9	34.8
05	26 50.7	294 44.7	50.5	131 58.3	53.2	291 53.7	06.7	315 40.1	34.8
06	41 53.1	309 44.1	N21 50.6	147 00.2	S26 53.3	306 55.6	N23 06.7	330 42.3	N20 34.8
V 07	56 55.6	324 43.5	50.7	162 02.2	53.3	321 57.5	06.7	345 44.6	34.8
I 08	71 58.1	339 42.8	50.8	177 04.1	53.3	336 59.4	06.6	0 46.8	34.9
E 09	87 00.5	354 42.2	50.8	192 06.0	53.3	352 01.3	06.6	15 49.0	34.9
R 10	102 03.0	9 41.6	50.9	207 08.0	53.3	7 03.2	06.6	30 51.3	34.9
N 11	117 05.5	24 40.9	51.0	222 09.9	53.4	22 05.1	06.6	45 53.5	34.9
12	132 07.9	39 40.3	N21 51.1	237 11.8	S26 53.4	37 07.1	N23 06.6	60 55.7	N20 35.0
E 13	147 10.4	54 39.7	51.2	252 13.7	53.4	52 09.0	06.6	75 58.0	35.0
14	162 12.9	69 39.0	51.2	267 15.6	53.4	67 10.9	06.6	91 00.2	35.0
S 15	177 15.3	84 38.4	51.3	282 17.6	53.4	82 12.8	06.5	106 02.4	35.0
16	192 17.8	99 37.8	51.4	297 19.5	53.4	97 14.7	06.5	121 04.7	35.1
17	207 20.2	114 37.1	51.5	312 21.4	53.5	112 16.6	06.5	136 06.9	35.1
18	222 22.7	129 36.5	N21 51.5	327 23.3	S26 53.5	127 18.5	N23 06.5	151 09.1	N20 35.1
19	237 25.2	144 35.8	51.6	342 25.2	53.5	142 20.4	06.5	166 11.4	35.1
20	252 27.6	159 35.2	51.7	357 27.1	53.5	157 22.3	06.5	181 13.6	35.2
21	267 30.1	174 34.6	51.8	12 29.0	53.5	172 24.2	06.5	196 15.8	35.2
22	282 32.6	189 33.9	51.8	27 30.9	53.6	187 26.1	06.4	211 18.1	35.2
23	297 35.0	204 33.3	51.9	42 32.8	53.6	202 28.0	06.4	226 20.3	35.2
4 00	312 37.5	219 32.6	N21 52.0	57 34.8	S26 53.6	217 29.9	N23 06.4	241 22.6	N20 35.2
01	327 40.0	234 32.0	52.0	72 36.7	53.6	232 31.9	06.4	256 24.8	35.3
02	342 42.4	249 31.4	52.1	87 38.6	53.6	247 33.8	06.4	271 27.0	35.3
03	357 44.9	264 30.7	52.2	102 40.5	53.6	262 35.7	06.4	286 29.3	35.3
04	12 47.4	279 30.1	52.2	117 42.4	53.7	277 37.6	06.4	301 31.5	35.3
05	27 49.8	294 29.4	52.3	132 44.3	53.7	292 39.5	06.3	316 33.7	35.4
06	42 52.3	309 28.8	N21 52.4	147 46.2	S26 53.7	307 41.4	N23 06.3	331 36.0	N20 35.4
07	57 54.7	324 28.2	52.4	162 48.1	53.7	322 43.3	06.3	346 38.2	35.4
S 08	72 57.2	339 27.5	52.5	177 49.9	53.7	337 45.2	06.3	1 40.4	35.4
A 09	87 59.7	354 26.9	52.6	192 51.8	53.8	352 47.1	06.3	16 42.7	35.5
B 10	103 02.1	9 26.2	52.6	207 53.7	53.8	7 49.0	06.3	31 44.9	35.5
A 11	118 04.6	24 25.6	52.7	222 55.6	53.8	22 50.9	06.2	46 47.1	35.5
12	133 07.1	39 24.9	N21 52.7	237 57.5	S26 53.8	37 52.9	N23 06.2	61 49.4	N20 35.5
D 13	148 09.5	54 24.3	52.8	252 59.4	53.8	52 54.8	06.2	76 51.6	35.6
14	163 12.0	69 23.7	52.8	268 01.3	53.9	67 56.7	06.2	91 53.9	35.6
15	178 14.5	84 23.0	52.9	283 03.2	53.9	82 58.6	06.2	106 56.1	35.6
O 16	193 16.9	99 22.4	53.0	298 05.0	53.9	98 00.5	06.2	121 58.3	35.6
17	208 19.4	114 21.7	53.0	313 06.9	53.9	113 02.4	06.2	137 00.6	35.7
18	223 21.8	129 21.1	N21 53.1	328 08.8	S26 53.9	128 04.3	N23 06.1	152 02.8	N20 35.7
19	238 24.3	144 20.4	53.1	343 10.7	54.0	143 06.2	06.1	167 05.0	35.7
20	253 26.8	159 19.8	53.2	358 12.6	54.0	158 08.1	06.1	182 07.3	35.7
21	268 29.2	174 19.1	53.2	13 14.4	54.0	173 10.0	06.1	197 09.5	35.7
22	283 31.7	189 18.5	53.3	28 16.3	54.0	188 12.0	06.1	212 11.7	35.8
23	298 34.2	204 17.9	53.3	43 18.2	54.0	203 13.9	06.1	227 14.0	35.8
Pas. Mer.	h m 3 12.9	v −0.6	d 0.1	v 1.9	d 0.0	v 1.9	d 0.0	v 2.2	d 0.0

ESTRELLAS		
Nombre	A.H.S.	Dec.
	° ′	° ′
Acamar	315 25.4	S40 17.7
Achernar	335 33.4	S57 13.5
Acrux	173 20.3	S63 06.6
Adhara	255 20.2	S28 58.3
Aldebaran	291 00.3	N16 30.7
Alioth	166 29.0	N55 57.5
Alkaid	153 06.3	N49 18.7
Al Na'ir	27 54.9	S46 57.1
Alnilam	275 56.1	S 1 12.0
Alphard	218 05.6	S 8 39.8
Alphecca	126 18.8	N26 42.9
Alpheratz	357 53.0	N29 05.8
Altair	62 17.0	N 8 52.4
Ankaa	353 24.6	S42 17.7
Antares	112 37.5	S26 26.1
Arcturus	146 04.3	N19 10.7
Atria	107 47.5	S69 02.0
Avior	234 22.5	S59 30.8
Bellatrix	278 42.2	N 6 21.1
Betelgeuse	271 11.6	N 7 24.5
Canopus	264 00.7	S52 41.6
Capella	280 48.5	N45 59.8
Deneb	49 37.4	N45 17.2
Denebola	182 43.4	N14 34.0
Diphda	349 05.0	S17 58.6
Dubhe	194 03.5	N61 44.8
Elnath	278 24.7	N28 36.5
Eltanin	90 50.1	N51 29.6
Enif	33 56.0	N 9 52.9
Fomalhaut	15 33.9	S29 36.8
Gacrux	172 11.7	S57 07.4
Gienah	176 02.1	S17 32.9
Hadar	149 01.4	S60 23.0
Hamal	328 11.3	N23 28.0
Kaus Aust.	83 55.8	S34 23.1
Kochab	137 19.4	N74 09.4
Markab	13 47.4	N15 12.8
Menkar	314 24.8	N 4 05.7
Menkent	148 18.7	S36 22.7
Miaplacidus	221 42.7	S69 43.4
Mirfak	308 53.9	N49 51.7
Nunki	76 09.5	S26 17.7
Peacock	53 33.2	S56 43.8
Pollux	243 39.5	N28 01.4
Procyon	245 09.8	N 5 13.4
Rasalhague	96 14.9	N12 33.7
Regulus	207 53.7	N11 57.8
Rigel	281 21.2	S 8 11.9
Rigil Kent.	140 04.7	S60 50.6
Sabik	102 23.0	S15 43.6
Schedar	349 51.0	N56 32.5
Shaula	96 34.3	S37 06.3
Sirius	258 42.3	S16 42.9
Spica	158 41.2	S11 10.0
Suhail	222 59.8	S43 26.2
Vega	80 44.9	N38 47.3
Zuben'ubi	137 15.7	S16 02.8

	A.H.S.	Pas. Mer.
	° ′	h m
Venus	268 09.6	9 21
Marte	105 10.3	20 10
Júpiter	265 05.8	9 32
Saturno	288 50.6	7 57

T.U.	SOL				LUNA					
	A.H.G.		Dec.		A.H.G.	v	Dec.	d	P.H.	
d h	°	′	°	′	°	′	′	° ′	′	′	′
2 00	178	25.9	N17	48.0	24	12.8	10.5	S23 23.6	0.8	54.6
01	193	25.9		47.3	38	42.3	10.5	23 22.8	0.9	54.6
02	208	26.0		46.7	53	11.8	10.5	23 21.9	1.0	54.6
03	223	26.0	. .	46.1	67	41.3	10.6	23 20.9	1.1	54.6
04	238	26.1		45.4	82	10.9	10.5	23 19.8	1.2	54.6
05	253	26.1		44.8	96	40.4	10.6	23 18.6	1.3	54.6
06	268	26.2	N17	44.1	111	10.0	10.7	S23 17.3	1.5	54.6
07	283	26.2		43.5	125	39.7	10.6	23 15.8	1.5	54.5
J 08	298	26.3		42.8	140	09.3	10.7	23 14.3	1.7	54.5
U 09	313	26.3	. .	42.2	154	39.0	10.7	23 12.6	1.8	54.5
E 10	328	26.4		41.6	169	08.7	10.7	23 10.8	1.9	54.5
E 11	343	26.4		40.9	183	38.4	10.8	23 08.9	2.0	54.5
V 12	358	26.5	N17	40.3	198	08.2	10.8	S23 06.9	2.1	54.5
13	13	26.5		39.6	212	38.0	10.8	23 04.8	2.2	54.5
E 14	28	26.5		39.0	227	07.8	10.9	23 02.6	2.4	54.5
15	43	26.6	. .	38.3	241	37.7	10.9	23 00.2	2.4	54.4
S 16	58	26.6		37.7	256	07.6	10.9	22 57.8	2.6	54.4
17	73	26.7		37.0	270	37.5	10.9	22 55.2	2.6	54.4
18	88	26.7	N17	36.4	285	07.4	11.0	S22 52.6	2.8	54.4
19	103	26.8		35.7	299	37.4	11.0	22 49.8	2.9	54.4
20	118	26.8		35.1	314	07.4	11.1	22 46.9	3.0	54.4
21	133	26.9	. .	34.4	328	37.5	11.1	22 43.9	3.1	54.4
22	148	26.9		33.8	343	07.6	11.1	22 40.8	3.2	54.4
23	163	27.0		33.1	357	37.7	11.2	22 37.6	3.4	54.4
3 00	178	27.0	N17	32.5	12	07.9	11.2	S22 34.2	3.4	54.3
01	193	27.1		31.8	26	38.1	11.2	22 30.8	3.5	54.3
02	208	27.1		31.2	41	08.3	11.3	22 27.3	3.7	54.3
03	223	27.2	. .	30.5	55	38.6	11.3	22 23.6	3.7	54.3
04	238	27.2		29.9	70	08.9	11.4	22 19.9	3.8	54.3
05	253	27.3		29.2	84	39.3	11.4	22 16.1	4.0	54.3
06	268	27.3	N17	28.6	99	09.7	11.4	S22 12.1	4.0	54.3
07	283	27.4		27.9	113	40.1	11.5	22 08.1	4.2	54.3
V 08	298	27.4		27.3	128	10.6	11.5	22 03.9	4.3	54.3
I 09	313	27.5	. .	26.6	142	41.1	11.6	21 59.6	4.3	54.3
E 10	328	27.6		25.9	157	11.7	11.6	21 55.3	4.5	54.2
R 11	343	27.6		25.3	171	42.3	11.7	21 50.8	4.6	54.2
N 12	358	27.7	N17	24.6	186	13.0	11.7	S21 46.2	4.6	54.2
13	13	27.7		24.0	200	43.7	11.7	21 41.6	4.8	54.2
E 14	28	27.8		23.3	215	14.4	11.8	21 36.8	4.8	54.2
S 15	43	27.8	. .	22.7	229	45.2	11.8	21 32.0	5.0	54.2
16	58	27.9		22.0	244	16.0	11.9	21 27.0	5.1	54.2
17	73	27.9		21.3	258	46.9	11.9	21 21.9	5.1	54.2
18	88	28.0	N17	20.7	273	17.8	12.0	S21 16.8	5.3	54.2
19	103	28.0		20.0	287	48.8	12.0	21 11.5	5.3	54.2
20	118	28.1		19.4	302	19.8	12.0	21 06.2	5.5	54.2
21	133	28.1	. .	18.7	316	50.8	12.1	21 00.7	5.5	54.2
22	148	28.2		18.0	331	21.9	12.2	20 55.2	5.6	54.1
23	163	28.3		17.4	345	53.1	12.2	20 49.6	5.8	54.1
4 00	178	28.3	N17	16.7	0	24.3	12.2	S20 43.8	5.8	54.1
01	193	28.4		16.1	14	55.5	12.3	20 38.0	5.9	54.1
02	208	28.4		15.4	29	26.8	12.4	20 32.1	6.0	54.1
03	223	28.5	. .	14.7	43	58.2	12.4	20 26.1	6.1	54.1
04	238	28.5		14.1	58	29.6	12.4	20 20.0	6.2	54.1
05	253	28.6		13.4	73	01.0	12.5	20 13.8	6.2	54.1
06	268	28.7	N17	12.7	87	32.5	12.5	S20 07.6	6.4	54.1
07	283	28.7		12.1	102	04.0	12.6	20 01.2	6.5	54.1
S 08	298	28.8		11.4	116	35.6	12.7	19 54.7	6.5	54.1
A 09	313	28.8	. .	10.7	131	07.3	12.6	19 48.2	6.6	54.1
B 10	328	28.9		10.1	145	38.9	12.8	19 41.6	6.7	54.1
A 11	343	29.0		09.4	160	10.7	12.8	19 34.9	6.8	54.1
D 12	358	29.0	N17	08.7	174	42.5	12.8	S19 28.1	6.9	54.1
O 13	13	29.1		08.1	189	14.3	12.9	19 21.2	7.0	54.1
14	28	29.1		07.4	203	46.2	12.9	19 14.2	7.0	54.1
15	43	29.2	. .	06.7	218	18.1	13.0	19 07.2	7.2	54.0
16	58	29.3		06.0	232	50.1	13.0	19 00.0	7.2	54.0
17	73	29.3		05.4	247	22.1	13.1	18 52.8	7.3	54.0
18	88	29.4	N17	04.7	261	54.2	13.1	S18 45.5	7.3	54.0
19	103	29.4		04.0	276	26.3	13.2	18 38.2	7.5	54.0
20	118	29.5		03.4	290	58.5	13.2	18 30.7	7.5	54.0
21	133	29.6	. .	02.7	305	30.7	13.3	18 23.2	7.6	54.0
22	148	29.6		02.0	320	03.0	13.3	18 15.6	7.7	54.0
23	163	29.7		01.3	334	35.3	13.4	S18 07.9	7.8	54.0
	SD	15.8	d	0.7	SD		14.8		14.8	14.7

Lat.	Crepúsculo Náutico	Crepúsculo Civil	Orto Sol	Orto Luna 2	Orto Luna 3	Orto Luna 4	Orto Luna 5
°	h m	h m	h m	h m	h m	h m	h m
N 72	▭	▭	▭	▬	▬	▬	(00 42) (23 02)
N 70	////	////	01 43	▬	▬	23 01	22 31
68	////	////	02 25	▬	22 41	22 20	22 09
66	////	00 53	02 53	21 50	21 53	21 52	21 51
64	////	01 51	03 14	21 04	21 22	21 31	21 36
62	////	02 23	03 31	20 34	20 59	21 14	21 24
60	00 48	02 46	03 45	20 12	20 40	20 59	21 13
N 58	01 40	03 05	03 57	19 53	20 25	20 47	21 04
56	02 10	03 20	04 08	19 38	20 11	20 36	20 56
54	02 32	03 33	04 17	19 25	20 00	20 27	20 49
52	02 49	03 44	04 25	19 13	19 50	20 19	20 42
50	03 04	03 54	04 32	19 03	19 40	20 11	20 36
45	03 32	04 14	04 47	18 41	19 21	19 55	20 24
N 40	03 53	04 30	05 00	18 24	19 05	19 41	20 13
35	04 10	04 43	05 11	18 09	18 52	19 30	20 04
30	04 23	04 54	05 20	17 56	18 40	19 20	19 56
20	04 45	05 13	05 36	17 34	18 20	19 03	19 42
N 10	05 02	05 28	05 50	17 16	18 03	18 48	19 30
0	05 16	05 41	06 03	16 58	17 47	18 34	19 19
S 10	05 28	05 53	06 15	16 40	17 30	18 20	19 07
20	05 39	06 06	06 29	16 21	17 13	18 05	18 55
30	05 50	06 19	06 44	15 59	16 53	17 47	18 41
35	05 56	06 26	06 53	15 46	16 41	17 37	18 33
40	06 02	06 34	07 03	15 32	16 28	17 25	18 24
45	06 08	06 43	07 14	15 14	16 11	17 12	18 13
S 50	06 14	06 53	07 28	14 52	15 52	16 55	18 00
52	06 17	06 58	07 35	14 42	15 42	16 47	17 53
54	06 20	07 03	07 42	14 30	15 32	16 38	17 47
56	06 24	07 09	07 50	14 17	15 19	16 28	17 39
58	06 27	07 15	07 59	14 01	15 06	16 17	17 30
S 60	06 31	07 22	08 10	13 42	14 49	16 03	17 20

Lat.	Ocaso Sol	Crepúsculo Civil	Crepúsculo Náutico	Ocaso Luna 2	Ocaso Luna 3	Ocaso Luna 4	Ocaso Luna 5
°	h m	h m	h m	h m	h m	h m	h m
N 72	▭	▭	▭	▬	▬	▬	01 02
N 70	22 23	////	////	▬	▬	▬	02 43
68	21 43	////	////	▬	▬	▬	01 25	03 22
66	21 16	23 08	////	24 35	00 35	02 12	03 49
64	20 56	22 17	////	00 12	01 20	02 43	04 10
62	20 39	21 46	////	00 46	01 50	03 05	04 26
60	20 25	21 24	23 14	01 10	02 12	03 24	04 40
N 58	20 14	21 06	22 28	01 30	02 30	03 39	04 52
56	20 03	20 51	21 59	01 46	02 45	03 52	05 02
54	19 54	20 38	21 38	02 00	02 58	04 03	05 11
52	19 46	20 27	21 21	02 13	03 10	04 13	05 19
50	19 39	20 17	21 07	02 23	03 20	04 21	05 26
45	19 24	19 57	20 39	02 46	03 41	04 40	05 41
N 40	19 12	19 42	20 18	03 04	03 58	04 55	05 54
35	19 01	19 29	20 02	03 19	04 12	05 08	06 04
30	18 52	19 18	19 48	03 32	04 25	05 19	06 13
20	18 36	18 59	19 27	03 55	04 46	05 38	06 29
N 10	18 22	18 44	19 10	04 14	05 05	05 54	06 43
0	18 10	18 31	18 56	04 32	05 22	06 10	06 56
S 10	17 57	18 19	18 44	04 50	05 39	06 25	07 09
20	17 44	18 07	18 33	05 09	05 57	06 41	07 22
30	17 29	17 54	18 22	05 31	06 18	07 00	07 38
35	17 20	17 47	18 17	05 44	06 30	07 11	07 47
40	17 10	17 39	18 11	05 59	06 44	07 23	07 57
45	16 58	17 30	18 05	06 17	07 01	07 37	08 09
S 50	16 44	17 20	17 58	06 39	07 21	07 55	08 23
52	16 38	17 15	17 56	06 50	07 31	08 03	08 30
54	16 31	17 10	17 53	07 02	07 42	08 13	08 37
56	16 23	17 04	17 49	07 15	07 54	08 23	08 45
58	16 14	16 58	17 46	07 31	08 08	08 35	08 54
S 60	16 03	16 51	17 42	07 50	08 25	08 49	09 05

Día	SOL E.T. (−) 00h	SOL E.T. (−) 12h	SOL Pas. Mer.	LUNA Pas. Sup.	LUNA Mer. Inf.	LUNA Edad	LUNA Fase
d	m s	m s	h m	h m	h m	d	%
2	06 16	06 14	12 06	23 10	10 45	13	97
3	06 12	06 09	12 06	23 58	11 34	14	99
4	06 07	06 04	12 06	24 45	12 22	15	100

T.U.	ARIES	VENUS −4.0		MARTE −1.4		JUPITER −2.0		SATURNO +0.1		ESTRELLAS		
	A.H.G.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.	Nombre	A.H.S.	Dec.
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′		° ′	° ′
5 00	313 36.6	219 17.2	N21 53.3	58 20.1	S26 54.1	218 15.8	N23 06.0	242 16.2	N20 35.8	Acamar	315 25.4	S40 17.7
01	328 39.1	234 16.6	53.4	73 21.9	54.1	233 17.7	06.0	257 18.5	35.8	Achernar	335 33.4	S57 13.5
02	343 41.6	249 15.9	53.4	88 23.8	54.1	248 19.6	06.0	272 20.7	35.9	Acrux	173 20.3	S63 06.6
03	358 44.0	264 15.3 . .	53.5	103 25.7 . .	54.1	263 21.5 . .	06.0	287 22.9 . .	35.9	Adhara	255 20.2	S28 58.3
04	13 46.5	279 14.6	53.5	118 27.5	54.1	278 23.4	06.0	302 25.2	35.9	Aldebaran	291 00.2	N16 30.7
05	28 49.0	294 14.0	53.6	133 29.4	54.1	293 25.3	06.0	317 27.4	35.9			
06	43 51.4	309 13.3	N21 53.6	148 31.3	S26 54.2	308 27.3	N23 06.0	332 29.7	N20 36.0	Alioth	166 29.0	N55 57.5
07	58 53.9	324 12.7	53.6	163 33.1	54.2	323 29.2	05.9	347 31.9	36.0	Alkaid	153 06.3	N49 18.7
D 08	73 56.3	339 12.0	53.7	178 35.0	54.2	338 31.1	05.9	2 34.1	36.0	Al Na'ir	27 54.9	S46 57.1
O 09	88 58.8	354 11.4 . .	53.7	193 36.9 . .	54.2	353 33.0 . .	05.9	17 36.4 . .	36.0	Alnilam	275 56.0	S 1 12.0
M 10	104 01.3	9 10.7	53.7	208 38.7	54.2	8 34.9	05.9	32 38.6	36.0	Alphard	218 05.6	S 8 39.8
I 11	119 03.7	24 10.1	53.8	223 40.6	54.3	23 36.8	05.9	47 40.9	36.1			
12	134 06.2	39 09.4	N21 53.8	238 42.4	S26 54.3	38 38.7	N23 05.9	62 43.1	N20 36.1	Alphecca	126 18.8	N26 42.9
N 13	149 08.7	54 08.8	53.8	253 44.3	54.3	53 40.6	05.8	77 45.3	36.1	Alpheratz	357 52.9	N29 05.8
G 14	164 11.1	69 08.1	53.9	268 46.1	54.3	68 42.6	05.8	92 47.6	36.1	Altair	62 17.0	N 8 52.4
O 15	179 13.6	84 07.5 . .	53.9	283 48.0 . .	54.3	83 44.5 . .	05.8	107 49.8 . .	36.2	Ankaa	353 24.5	S42 17.7
16	194 16.1	99 06.8	53.9	298 49.8	54.4	98 46.4	05.8	122 52.0	36.2	Antares	112 37.6	S26 26.1
17	209 18.5	114 06.2	54.0	313 51.7	54.4	113 48.3	05.8	137 54.3	36.2			
18	224 21.0	129 05.5	N21 54.0	328 53.5	S26 54.4	128 50.2	N23 05.8	152 56.5	N20 36.2	Arcturus	146 04.3	N19 10.7
19	239 23.5	144 04.9	54.0	343 55.4	54.4	143 52.1	05.7	167 58.8	36.3	Atria	107 47.5	S69 02.0
20	254 25.9	159 04.2	54.0	358 57.2	54.4	158 54.0	05.7	183 01.0	36.3	Avior	234 22.5	S59 30.8
21	269 28.4	174 03.6 . .	54.1	13 59.1 . .	54.5	173 55.9 . .	05.7	198 03.3 . .	36.3	Bellatrix	278 42.2	N 6 21.1
22	284 30.8	189 02.9	54.1	29 00.9	54.5	188 57.9	05.7	213 05.5	36.3	Betelgeuse	271 11.6	N 7 24.5
23	299 33.3	204 02.3	54.1	44 02.8	54.5	203 59.8	05.7	228 07.7	36.3			
6 00	314 35.8	219 01.6	N21 54.1	59 04.6	S26 54.5	219 01.7	N23 05.7	243 10.0	N20 36.4	Canopus	264 00.7	S52 41.6
01	329 38.2	234 01.0	54.2	74 06.4	54.5	234 03.6	05.6	258 12.2	36.4	Capella	280 48.5	N45 59.8
02	344 40.7	249 00.3	54.2	89 08.3	54.6	249 05.5	05.6	273 14.5	36.4	Deneb	49 37.4	N45 17.2
03	359 43.2	263 59.7 . .	54.2	104 10.1 . .	54.6	264 07.4 . .	05.6	288 16.7 . .	36.4	Denebola	182 43.4	N14 34.0
04	14 45.6	278 59.0	54.2	119 11.9	54.6	279 09.3	05.6	303 18.9	36.5	Diphda	349 05.0	S17 58.6
05	29 48.1	293 58.4	54.2	134 13.8	54.6	294 11.3	05.6	318 21.2	36.5			
06	44 50.6	308 57.7	N21 54.2	149 15.6	S26 54.6	309 13.2	N23 05.6	333 23.4	N20 36.5	Dubhe	194 03.5	N61 44.8
07	59 53.0	323 57.1	54.3	164 17.4	54.7	324 15.1	05.5	348 25.7	36.5	Elnath	278 24.6	N28 36.5
L 08	74 55.5	338 56.4	54.3	179 19.3	54.7	339 17.0	05.5	3 27.9	36.6	Eltanin	90 50.1	N51 29.6
09	89 57.9	353 55.8 . .	54.3	194 21.1 . .	54.7	354 18.9 . .	05.5	18 30.2 . .	36.6	Enif	33 55.9	N 9 52.9
U 10	105 00.4	8 55.1	54.3	209 22.9	54.7	9 20.8	05.5	33 32.4	36.6	Fomalhaut	15 33.9	S29 36.8
N 11	120 02.9	23 54.5	54.3	224 24.7	54.7	24 22.8	05.5	48 34.6	36.6			
12	135 05.3	38 53.8	N21 54.3	239 26.6	S26 54.8	39 24.7	N23 05.5	63 36.9	N20 36.6	Gacrux	172 11.8	S57 07.4
E 13	150 07.8	53 53.2	54.3	254 28.4	54.8	54 26.6	05.4	78 39.1	36.7	Gienah	176 02.1	S17 32.9
14	165 10.3	68 52.5	54.3	269 30.2	54.8	69 28.5	05.4	93 41.4	36.7	Hadar	149 01.4	S60 23.0
S 15	180 12.7	83 51.8 . .	54.3	284 32.0 . .	54.8	84 30.4 . .	05.4	108 43.6 . .	36.7	Hamal	328 11.2	N23 28.1
16	195 15.2	98 51.2	54.3	299 33.8	54.8	99 32.3	05.4	123 45.9	36.7	Kaus Aust.	83 55.8	S34 23.1
17	210 17.7	113 50.5	54.3	314 35.7	54.9	114 34.2	05.4	138 48.1	36.8			
18	225 20.1	128 49.9	N21 54.4	329 37.5	S26 54.9	129 36.2	N23 05.4	153 50.3	N20 36.8	Kochab	137 19.5	N74 09.4
19	240 22.6	143 49.2	54.4	344 39.3	54.9	144 38.1	05.3	168 52.6	36.8	Markab	13 47.3	N15 12.8
20	255 25.1	158 48.6	54.4	359 41.1	54.9	159 40.0	05.3	183 54.8	36.8	Menkar	314 24.8	N 4 05.7
21	270 27.5	173 47.9 . .	54.4	14 42.9 . .	54.9	174 41.9 . .	05.3	198 57.1 . .	36.8	Menkent	148 18.7	S36 22.7
22	285 30.0	188 47.3	54.4	29 44.7	55.0	189 43.8	05.3	213 59.3	36.9	Miaplacidus	221 42.7	S69 43.4
23	300 32.4	203 46.6	54.4	44 46.5	55.0	204 45.7	05.3	229 01.6	36.9			
7 00	315 34.9	218 45.9	N21 54.4	59 48.3	S26 55.0	219 47.7	N23 05.3	244 03.8	N20 36.9	Mirfak	308 53.8	N49 51.8
01	330 37.4	233 45.3	54.3	74 50.2	55.0	234 49.6	05.2	259 06.0	36.9	Nunki	76 09.5	S26 17.7
02	345 39.8	248 44.6	54.3	89 52.0	55.0	249 51.5	05.2	274 08.3	37.0	Peacock	53 33.2	S56 43.8
03	0 42.3	263 44.0 . .	54.3	104 53.8 . .	55.1	264 53.4 . .	05.2	289 10.5 . .	37.0	Pollux	243 39.4	N28 01.4
04	15 44.8	278 43.3	54.3	119 55.6	55.1	279 55.3	05.2	304 12.8	37.0	Procyon	245 09.8	N 5 13.4
05	30 47.2	293 42.7	54.3	134 57.4	55.1	294 57.3	05.2	319 15.0	37.0			
06	45 49.7	308 42.0	N21 54.3	149 59.2	S26 55.1	309 59.2	N23 05.2	334 17.3	N20 37.0	Rasalhague	96 14.9	N12 33.7
07	60 52.2	323 41.3	54.3	165 01.0	55.2	325 01.1	05.1	349 19.5	37.1	Regulus	207 53.7	N11 57.8
M 08	75 54.6	338 40.7	54.3	180 02.8	55.2	340 03.0	05.1	4 21.8	37.1	Rigel	281 21.2	S 8 11.9
A 09	90 57.1	353 40.0 . .	54.3	195 04.6 . .	55.2	355 04.9 . .	05.1	19 24.0 . .	37.1	Rigil Kent.	140 04.7	S60 50.6
R 10	105 59.5	8 39.4	54.3	210 06.4	55.2	10 06.8	05.1	34 26.3	37.1	Sabik	102 23.0	S15 43.6
T 11	121 02.0	23 38.7	54.3	225 08.1	55.2	25 08.8	05.1	49 28.5	37.2			
12	136 04.5	38 38.0	N21 54.2	240 09.9	S26 55.3	40 10.7	N23 05.1	64 30.7	N20 37.2	Schedar	349 51.0	N56 32.5
E 13	151 06.9	53 37.4	54.2	255 11.7	55.3	55 12.6	05.0	79 33.0	37.2	Shaula	96 34.3	S37 06.3
14	166 09.4	68 36.7	54.2	270 13.5	55.3	70 14.5	05.0	94 35.2	37.2	Sirius	258 42.2	S16 42.9
S 15	181 11.9	83 36.1 . .	54.2	285 15.3 . .	55.3	85 16.4 . .	05.0	109 37.5 . .	37.2	Spica	158 41.2	S11 10.0
16	196 14.3	98 35.4	54.2	300 17.1	55.3	100 18.4	05.0	124 39.7	37.3	Suhail	222 59.8	S43 26.2
17	211 16.8	113 34.7	54.2	315 18.9	55.4	115 20.3	05.0	139 42.0	37.3			
18	226 19.3	128 34.1	N21 54.1	330 20.7	S26 55.4	130 22.2	N23 04.9	154 44.2	N20 37.3	Vega	80 44.9	N38 47.3
19	241 21.7	143 33.4	54.1	345 22.4	55.4	145 24.1	04.9	169 46.5	37.3	Zuben'ubi	137 15.8	S16 02.8
20	256 24.2	158 32.8	54.1	0 24.2	55.4	160 26.0	04.9	184 48.7	37.4			
21	271 26.7	173 32.1 . .	54.1	15 26.0 . .	55.4	175 28.0 . .	04.9	199 51.0 . .	37.4		A.H.S.	Pas. Mer.
22	286 29.1	188 31.4	54.0	30 27.8	55.5	190 29.9	04.9	214 53.2	37.4		° ′	h m
23	301 31.6	203 30.8	54.0	45 29.6	55.5	205 31.8	04.9	229 55.5	37.4	Venus	264 25.9	9 24
	h m									Marte	104 28.8	20 01
Pas. Mer.	3 01.1	*v* −0.7	*d* 0.0	*v* 1.8	*d* 0.0	*v* 1.9	*d* 0.0	*v* 2.2	*d* 0.0	Júpiter	264 25.9	9 23
										Saturno	288 34.2	7 46

T.U.	SOL A.H.G.	SOL Dec.	LUNA A.H.G.	v	LUNA Dec.	d	P.H.
d h	° ′	° ′	° ′	′	° ′	′	′
5 00	178 29.8	N17 00.7	349 07.7	13.4	S18 00.1	7.8	54.0
01	193 29.8	17 00.0	3 40.1	13.5	17 52.3	8.0	54.0
02	208 29.9	16 59.3	18 12.6	13.5	17 44.3	8.0	54.0
03	223 29.9	. . 58.6	32 45.1	13.6	17 36.3	8.0	54.0
04	238 30.0	58.0	47 17.7	13.6	17 28.3	8.2	54.0
05	253 30.1	57.3	61 50.3	13.7	17 20.1	8.2	54.0
06	268 30.1	N16 56.6	76 23.0	13.7	S17 11.9	8.3	54.0
07	283 30.2	55.9	90 55.7	13.8	17 03.6	8.3	54.0
D 08	298 30.3	55.3	105 28.5	13.8	16 55.3	8.5	54.0
O 09	313 30.3	. . 54.6	120 01.3	13.9	16 46.8	8.4	54.0
M 10	328 30.4	53.9	134 34.2	13.9	16 38.4	8.6	54.0
I 11	343 30.5	53.2	149 07.1	13.9	16 29.8	8.7	54.0
N 12	358 30.5	N16 52.5	163 40.0	14.0	S16 21.1	8.7	54.0
G 13	13 30.6	51.9	178 13.0	14.1	16 12.4	8.7	54.0
O 14	28 30.7	51.2	192 46.1	14.0	16 03.7	8.9	54.0
15	43 30.7	. . 50.5	207 19.1	14.2	15 54.8	8.9	54.0
16	58 30.8	49.8	221 52.3	14.2	15 45.9	8.9	54.0
17	73 30.9	49.1	236 25.5	14.2	15 37.0	9.1	54.0
18	88 30.9	N16 48.4	250 58.7	14.3	S15 27.9	9.1	54.0
19	103 31.0	47.8	265 32.0	14.3	15 18.8	9.1	54.0
20	118 31.1	47.1	280 05.3	14.3	15 09.7	9.2	54.0
21	133 31.1	. . 46.4	294 38.6	14.4	15 00.5	9.3	54.0
22	148 31.2	45.7	309 12.0	14.5	14 51.2	9.4	54.0
23	163 31.3	45.0	323 45.5	14.5	14 41.8	9.4	54.0
6 00	178 31.3	N16 44.3	338 19.0	14.5	S14 32.4	9.4	54.0
01	193 31.4	43.7	352 52.5	14.6	14 23.0	9.6	54.0
02	208 31.5	43.0	7 26.1	14.6	14 13.4	9.5	54.0
03	223 31.5	. . 42.3	21 59.7	14.6	14 03.9	9.7	54.0
04	238 31.6	41.6	36 33.3	14.7	13 54.2	9.7	54.0
05	253 31.7	40.9	51 07.0	14.8	13 44.5	9.7	54.0
06	268 31.8	N16 40.2	65 40.8	14.8	S13 34.8	9.8	54.0
07	283 31.8	39.5	80 14.6	14.8	13 25.0	9.9	54.0
08	298 31.9	38.8	94 48.4	14.8	13 15.1	9.9	54.0
L 09	313 32.0	. . 38.1	109 22.2	14.9	13 05.2	9.9	54.0
U 10	328 32.0	37.5	123 56.1	14.9	12 55.3	10.0	54.0
N 11	343 32.1	36.8	138 30.0	15.0	12 45.3	10.1	54.0
E 12	358 32.2	N16 36.1	153 04.0	15.0	S12 35.2	10.1	54.0
S 13	13 32.3	35.4	167 38.0	15.1	12 25.1	10.2	54.0
14	28 32.3	34.7	182 12.1	15.0	12 14.9	10.2	54.0
15	43 32.4	. . 34.0	196 46.1	15.1	12 04.7	10.3	54.0
16	58 32.5	33.3	211 20.2	15.2	11 54.4	10.3	54.0
17	73 32.5	32.6	225 54.4	15.2	11 44.1	10.3	54.0
18	88 32.6	N16 31.9	240 28.6	15.2	S11 33.8	10.5	54.0
19	103 32.7	31.2	255 02.8	15.2	11 23.3	10.4	54.0
20	118 32.8	30.5	269 37.0	15.3	11 12.9	10.5	54.0
21	133 32.8	. . 29.8	284 11.3	15.3	11 02.4	10.5	54.0
22	148 32.9	29.1	298 45.6	15.3	10 51.9	10.6	54.0
23	163 33.0	28.4	313 19.9	15.4	10 41.3	10.7	54.0
7 00	178 33.1	N16 27.7	327 54.3	15.4	S10 30.6	10.6	54.0
01	193 33.1	27.0	342 28.7	15.4	10 20.0	10.7	54.0
02	208 33.2	26.3	357 03.1	15.5	10 09.3	10.8	54.0
03	223 33.3	. . 25.6	11 37.6	15.4	9 58.5	10.8	54.1
04	238 33.4	24.9	26 12.0	15.6	9 47.7	10.8	54.1
05	253 33.4	24.3	40 46.6	15.5	9 36.9	10.9	54.1
06	268 33.5	N16 23.6	55 21.1	15.5	S 9 26.0	10.9	54.1
07	283 33.6	22.9	69 55.6	15.6	9 15.1	11.0	54.1
M 08	298 33.7	22.2	84 30.2	15.6	9 04.1	11.0	54.1
A 09	313 33.8	. . 21.4	99 04.8	15.7	8 53.1	11.0	54.1
R 10	328 33.8	20.7	113 39.5	15.6	8 42.1	11.0	54.1
T 11	343 33.9	20.0	128 14.1	15.7	8 31.1	11.1	54.1
E 12	358 34.0	N16 19.3	142 48.8	15.7	S 8 20.0	11.2	54.1
S 13	13 34.1	18.6	157 23.5	15.7	8 08.8	11.1	54.1
14	28 34.1	17.9	171 58.2	15.7	7 57.7	11.2	54.1
15	43 34.2	. . 17.2	186 32.9	15.8	7 46.5	11.3	54.1
16	58 34.3	16.5	201 07.7	15.8	7 35.2	11.2	54.1
17	73 34.4	15.8	215 42.5	15.8	7 24.0	11.3	54.1
18	88 34.5	N16 15.1	230 17.3	15.8	S 7 12.7	11.3	54.2
19	103 34.5	14.4	244 52.1	15.8	7 01.4	11.4	54.2
20	118 34.6	13.7	259 26.9	15.8	6 50.0	11.4	54.2
21	133 34.7	. . 13.0	274 01.7	15.9	6 38.6	11.4	54.2
22	148 34.8	12.3	288 36.6	15.9	6 27.2	11.4	54.2
23	163 34.9	11.6	303 11.5	15.8	S 6 15.8	11.5	54.2
	SD 15.8	d 0.7	SD 14.7		14.7		14.7

Lat.	Crepúsculo Náutico	Crepúsculo Civil	Orto Sol	Orto Luna 5	Orto Luna 6	Orto Luna 7	Orto Luna 8
°	h m	h m	h m	h m	h m	h m	h m
N 72	////	////	00 58	{00 42 / 23 02}	22 31	22 08	21 49
N 70	////	////	02 04	22 31	22 13	21 59	21 46
68	////	////	02 40	22 09	22 00	21 52	21 44
66	////	01 24	03 05	21 51	21 48	21 45	21 43
64	////	02 07	03 24	21 36	21 39	21 40	21 41
62	////	02 35	03 39	21 24	21 30	21 35	21 40
60	01 15	02 56	03 52	21 13	21 23	21 31	21 39
N 58	01 54	03 13	04 04	21 04	21 17	21 28	21 38
56	02 20	03 27	04 13	20 56	21 11	21 25	21 37
54	02 40	03 39	04 22	20 49	21 06	21 22	21 36
52	02 56	03 49	04 29	20 42	21 02	21 19	21 35
50	03 10	03 59	04 36	20 36	20 58	21 17	21 34
45	03 36	04 18	04 51	20 24	20 49	21 11	21 33
N 40	03 57	04 33	05 03	20 13	20 41	21 07	21 32
35	04 12	04 46	05 13	20 04	20 35	21 03	21 31
30	04 26	04 56	05 22	19 56	20 29	21 00	21 30
20	04 46	05 14	05 37	19 42	20 19	20 54	21 28
N 10	05 02	05 28	05 50	19 30	20 10	20 49	21 26
0	05 16	05 41	06 02	19 19	20 02	20 44	21 25
S 10	05 27	05 53	06 14	19 07	19 54	20 39	21 24
20	05 38	06 04	06 27	18 55	19 45	20 34	21 22
30	05 48	06 17	06 42	18 41	19 35	20 28	21 21
35	05 53	06 23	06 50	18 33	19 29	20 24	21 20
40	05 59	06 31	06 59	18 24	19 22	20 20	21 19
45	06 04	06 39	07 10	18 13	19 14	20 16	21 17
S 50	06 10	06 49	07 24	18 00	19 05	20 10	21 16
52	06 13	06 53	07 30	17 53	19 01	20 08	21 15
54	06 16	06 58	07 37	17 47	18 56	20 05	21 14
56	06 19	07 03	07 44	17 39	18 51	20 02	21 14
58	06 22	07 09	07 53	17 30	18 45	19 59	21 13
S 60	06 25	07 16	08 03	17 20	18 38	19 55	21 12

Lat.	Ocaso Sol	Crepúsculo Civil	Crepúsculo Náutico	Ocaso Luna 5	Ocaso Luna 6	Ocaso Luna 7	Ocaso Luna 8
°	h m	h m	h m	h m	h m	h m	h m
N 72	23 00	////	////	01 02	04 15	06 15	08 05
N 70	22 02	////	////	02 43	04 44	06 31	08 12
68	21 28	////	////	03 22	05 06	06 43	08 17
66	21 04	22 41	////	03 49	05 23	06 53	08 22
64	20 46	22 01	////	04 10	05 36	07 01	08 25
62	20 30	21 34	////	04 26	05 48	07 09	08 29
60	20 18	21 14	22 50	04 40	05 57	07 15	08 32
N 58	20 07	20 57	22 14	04 52	06 06	07 20	08 34
56	19 57	20 43	21 49	05 02	06 13	07 25	08 36
54	19 49	20 31	21 30	05 11	06 20	07 29	08 38
52	19 41	20 21	21 14	05 19	06 26	07 33	08 40
50	19 34	20 12	21 00	05 26	06 31	07 37	08 42
45	19 20	19 53	20 34	05 41	06 43	07 44	08 45
N 40	19 08	19 38	20 14	05 54	06 52	07 50	08 48
35	18 58	19 26	19 59	06 04	07 00	07 56	08 51
30	18 49	19 15	19 46	06 13	07 07	08 00	08 53
20	18 34	18 58	19 25	06 29	07 19	08 09	08 57
N 10	18 21	18 43	19 09	06 43	07 30	08 16	09 01
0	18 09	18 31	18 56	06 56	07 40	08 22	09 04
S 10	17 57	18 19	18 44	07 09	07 50	08 29	09 07
20	17 45	18 08	18 34	07 22	08 00	08 36	09 10
30	17 30	17 55	18 24	07 38	08 12	08 44	09 14
35	17 22	17 49	18 19	07 47	08 19	08 48	09 16
40	17 13	17 41	18 14	07 57	08 26	08 53	09 18
45	17 02	17 33	18 08	08 09	08 35	08 59	09 21
S 50	16 49	17 23	18 02	08 23	08 46	09 06	09 24
52	16 43	17 19	17 59	08 30	08 51	09 09	09 26
54	16 36	17 14	17 57	08 37	08 56	09 13	09 28
56	16 28	17 09	17 54	08 45	09 02	09 17	09 29
58	16 20	17 03	17 51	08 54	09 09	09 21	09 31
S 60	16 10	16 57	17 47	09 05	09 17	09 26	09 34

Día	SOL E.T. (−) 00h	SOL E.T. (−) 12h	SOL Pas. Mer.	LUNA Pas. Sup.	LUNA Mer. Inf.	LUNA Edad	LUNA Fase
d	m s	m s	h m	h m	h m	d	%
5	06 01	05 58	12 06	00 45	13 07	16	98
6	05 55	05 51	12 06	01 29	13 51	17	95
7	05 48	05 44	12 06	02 12	14 33	18	91

T.U.	ARIES	VENUS −4.0		MARTE −1.3		JUPITER −2.0		SATURNO +0.1	
	A.H.G.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
8 00	316 34.0	218 30.1	N21 54.0	60 31.3	S26 55.5	220 33.7	N23 04.8	244 57.7	N20 37.4
01	331 36.5	233 29.5	54.0	75 33.1	55.5	235 35.6	04.8	260 00.0	37.5
02	346 39.0	248 28.8	53.9	90 34.9	55.5	250 37.6	04.8	275 02.2	37.5
03	1 41.4	263 28.1 . .	53.9	105 36.7 . .	55.6	265 39.5 . .	04.8	290 04.5 . .	37.5
04	16 43.9	278 27.5	53.9	120 38.4	55.6	280 41.4	04.8	305 06.7	37.5
05	31 46.4	293 26.8	53.8	135 40.2	55.6	295 43.3	04.8	320 09.0	37.5
06	46 48.8	308 26.2	N21 53.8	150 42.0	S26 55.6	310 45.2	N23 04.7	335 11.2	N20 37.6
M 07	61 51.3	323 25.5	53.8	165 43.7	55.6	325 47.2	04.7	350 13.5	37.6
I 08	76 53.8	338 24.8	53.7	180 45.5	55.7	340 49.1	04.7	5 15.7	37.6
E 09	91 56.2	353 24.2 . .	53.7	195 47.3 . .	55.7	355 51.0 . .	04.7	20 17.9 . .	37.6
R 10	106 58.7	8 23.5	53.7	210 49.0	55.7	10 52.9	04.7	35 20.2	37.7
C 11	122 01.2	23 22.8	53.6	225 50.8	55.7	25 54.8	04.6	50 22.4	37.7
O 12	137 03.6	38 22.2	N21 53.6	240 52.6	S26 55.8	40 56.8	N23 04.6	65 24.7	N20 37.7
L 13	152 06.1	53 21.5	53.5	255 54.3	55.8	55 58.7	04.6	80 26.9	37.7
E 14	167 08.5	68 20.9	53.5	270 56.1	55.8	71 00.6	04.6	95 29.2	37.7
S 15	182 11.0	83 20.2 . .	53.5	285 57.8 . .	55.8	86 02.5 . .	04.6	110 31.4 . .	37.8
16	197 13.5	98 19.5	53.4	300 59.6	55.8	101 04.5	04.6	125 33.7	37.8
17	212 15.9	113 18.9	53.4	316 01.3	55.9	116 06.4	04.5	140 35.9	37.8
18	227 18.4	128 18.2	N21 53.3	331 03.1	S26 55.9	131 08.3	N23 04.5	155 38.2	N20 37.8
19	242 20.9	143 17.5	53.3	346 04.9	55.9	146 10.2	04.5	170 40.4	37.8
20	257 23.3	158 16.9	53.2	1 06.6	55.9	161 12.1	04.5	185 42.7	37.9
21	272 25.8	173 16.2 . .	53.2	16 08.4 . .	55.9	176 14.1 . .	04.5	200 44.9 . .	37.9
22	287 28.3	188 15.5	53.1	31 10.1	56.0	191 16.0	04.4	215 47.2	37.9
23	302 30.7	203 14.9	53.1	46 11.8	56.0	206 17.9	04.4	230 49.5	37.9
9 00	317 33.2	218 14.2	N21 53.0	61 13.6	S26 56.0	221 19.8	N23 04.4	245 51.7	N20 38.0
01	332 35.6	233 13.5	53.0	76 15.3	56.0	236 21.8	04.4	260 54.0	38.0
02	347 38.1	248 12.9	52.9	91 17.1	56.0	251 23.7	04.4	275 56.2	38.0
03	2 40.6	263 12.2 . .	52.9	106 18.8 . .	56.1	266 25.6 . .	04.4	290 58.5 . .	38.0
04	17 43.0	278 11.5	52.8	121 20.6	56.1	281 27.5	04.3	306 00.7	38.0
05	32 45.5	293 10.9	52.8	136 22.3	56.1	296 29.5	04.3	321 03.0	38.1
06	47 48.0	308 10.2	N21 52.7	151 24.0	S26 56.1	311 31.4	N23 04.3	336 05.2	N20 38.1
07	62 50.4	323 09.5	52.7	166 25.8	56.1	326 33.3	04.3	351 07.5	38.1
J 08	77 52.9	338 08.9	52.6	181 27.5	56.2	341 35.2	04.3	6 09.7	38.1
U 09	92 55.4	353 08.2 . .	52.5	196 29.2 . .	56.2	356 37.2 . .	04.2	21 12.0 . .	38.1
E 10	107 57.8	8 07.5	52.5	211 31.0	56.2	11 39.1	04.2	36 14.2	38.2
V 11	123 00.3	23 06.9	52.4	226 32.7	56.2	26 41.0	04.2	51 16.5	38.2
E 12	138 02.8	38 06.2	N21 52.4	241 34.4	S26 56.3	41 42.9	N23 04.2	66 18.7	N20 38.2
S 13	153 05.2	53 05.5	52.3	256 36.2	56.3	56 44.9	04.2	81 21.0	38.2
14	168 07.7	68 04.9	52.2	271 37.9	56.3	71 46.8	04.2	96 23.2	38.2
15	183 10.1	83 04.2 . .	52.2	286 39.6 . .	56.3	86 48.7 . .	04.1	111 25.5 . .	38.3
16	198 12.6	98 03.5	52.1	301 41.3	56.3	101 50.6	04.1	126 27.7	38.3
17	213 15.1	113 02.9	52.0	316 43.1	56.4	116 52.6	04.1	141 30.0	38.3
18	228 17.5	128 02.2	N21 51.9	331 44.8	S26 56.4	131 54.5	N23 04.1	156 32.2	N20 38.3
19	243 20.0	143 01.5	51.9	346 46.5	56.4	146 56.4	04.1	171 34.5	38.3
20	258 22.5	158 00.9	51.8	1 48.2	56.4	161 58.3	04.0	186 36.8	38.4
21	273 24.9	173 00.2 . .	51.7	16 50.0 . .	56.4	177 00.3 . .	04.0	201 39.0 . .	38.4
22	288 27.4	187 59.5	51.7	31 51.7	56.5	192 02.2	04.0	216 41.3	38.4
23	303 29.9	202 58.9	51.6	46 53.4	56.5	207 04.1	04.0	231 43.5	38.4
10 00	318 32.3	217 58.2	N21 51.5	61 55.1	S26 56.5	222 06.0	N23 04.0	246 45.8	N20 38.4
01	333 34.8	232 57.5	51.4	76 56.8	56.5	237 08.0	03.9	261 48.0	38.5
02	348 37.2	247 56.9	51.4	91 58.5	56.5	252 09.9	03.9	276 50.3	38.5
03	3 39.7	262 56.2 . .	51.3	107 00.2 . .	56.6	267 11.8 . .	03.9	291 52.5 . .	38.5
04	18 42.2	277 55.5	51.2	122 02.0	56.6	282 13.7	03.9	306 54.8	38.5
05	33 44.6	292 54.8	51.1	137 03.7	56.6	297 15.7	03.9	321 57.0	38.6
06	48 47.1	307 54.2	N21 51.0	152 05.4	S26 56.6	312 17.6	N23 03.8	336 59.3	N20 38.6
07	63 49.6	322 53.5	51.0	167 07.1	56.6	327 19.5	03.8	352 01.6	38.6
V 08	78 52.0	337 52.8	50.9	182 08.8	56.7	342 21.5	03.8	7 03.8	38.6
I 09	93 54.5	352 52.2 . .	50.8	197 10.5 . .	56.7	357 23.4 . .	03.8	22 06.1 . .	38.6
E 10	108 57.0	7 51.5	50.7	212 12.2	56.7	12 25.3	03.8	37 08.3	38.7
R 11	123 59.4	22 50.8	50.6	227 13.9	56.7	27 27.2	03.8	52 10.6	38.7
N 12	139 01.9	37 50.2	N21 50.5	242 15.6	S26 56.8	42 29.2	N23 03.7	67 12.8	N20 38.7
E 13	154 04.4	52 49.5	50.4	257 17.3	56.8	57 31.1	03.7	82 15.1	38.7
S 14	169 06.8	67 48.8	50.3	272 19.0	56.8	72 33.0	03.7	97 17.4	38.7
15	184 09.3	82 48.1 . .	50.3	287 20.7 . .	56.8	87 35.0 . .	03.7	112 19.6 . .	38.8
16	199 11.7	97 47.5	50.2	302 22.4	56.8	102 36.9	03.7	127 21.9	38.8
17	214 14.2	112 46.8	50.1	317 24.1	56.9	117 38.8	03.6	142 24.1	38.8
18	229 16.7	127 46.1	N21 50.0	332 25.8	S26 56.9	132 40.7	N23 03.6	157 26.4	N20 38.8
19	244 19.1	142 45.5	49.9	347 27.5	56.9	147 42.7	03.6	172 28.6	38.8
20	259 21.6	157 44.8	49.8	2 29.2	56.9	162 44.6	03.6	187 30.9	38.9
21	274 24.1	172 44.1 . .	49.7	17 30.8 . .	56.9	177 46.5 . .	03.6	202 33.2 . .	38.9
22	289 26.5	187 43.4	49.6	32 32.5	57.0	192 48.5	03.5	217 35.4	38.9
23	304 29.0	202 42.8	49.5	47 34.2	57.0	207 50.4	03.5	232 37.7	38.9
	h m								
Pas. Mer.	2 49.3	v −0.7	d 0.1	v 1.7	d 0.0	v 1.9	d 0.0	v 2.3	d 0.0

ESTRELLAS	A.H.S.	Dec.
Nombre	° ′	° ′
Acamar	315 25.3	S40 17.7
Achernar	335 33.4	S57 13.5
Acrux	173 20.3	S63 06.6
Adhara	255 20.2	S28 58.3
Aldebaran	291 00.2	N16 30.7
Alioth	166 29.0	N55 57.5
Alkaid	153 06.3	N49 18.7
Al Na'ir	27 54.8	S46 57.1
Alnilam	275 56.0	S 1 12.0
Alphard	218 05.6	S 8 39.8
Alphecca	126 18.8	N26 42.9
Alpheratz	357 52.9	N29 05.8
Altair	62 17.0	N 8 52.4
Ankaa	353 24.5	S42 17.7
Antares	112 37.6	S26 26.1
Arcturus	146 04.3	N19 10.7
Atria	107 47.6	S69 02.0
Avior	234 22.5	S59 30.7
Bellatrix	278 42.2	N 6 21.1
Betelgeuse	271 11.6	N 7 24.5
Canopus	264 00.7	S52 41.6
Capella	280 48.5	N45 59.8
Deneb	49 37.4	N45 17.2
Denebola	182 43.4	N14 34.0
Diphda	349 05.0	S17 58.6
Dubhe	194 03.5	N61 44.8
Elnath	278 24.6	N28 36.5
Eltanin	90 50.1	N51 29.6
Enif	33 55.9	N 9 52.9
Fomalhaut	15 33.9	S29 36.8
Gacrux	172 11.8	S57 07.4
Gienah	176 02.1	S17 32.9
Hadar	149 01.4	S60 23.0
Hamal	328 11.2	N23 28.1
Kaus Aust.	83 55.8	S34 23.1
Kochab	137 19.5	N74 09.4
Markab	13 47.3	N15 12.8
Menkar	314 24.8	N 4 05.8
Menkent	148 18.7	S36 22.7
Miaplacidus	221 42.7	S69 43.3
Mirfak	308 53.8	N49 51.8
Nunki	76 09.5	S26 17.7
Peacock	53 33.2	S56 43.8
Pollux	243 39.4	N28 01.4
Procyon	245 09.8	N 5 13.4
Rasalhague	96 14.9	N12 33.7
Regulus	207 53.7	N11 57.8
Rigel	281 21.2	S 8 11.9
Rigil Kent.	140 04.8	S60 50.6
Sabik	102 23.0	S15 43.6
Schedar	349 50.9	N56 32.5
Shaula	96 34.3	S37 06.3
Sirius	258 42.2	S16 42.9
Spica	158 41.2	S11 10.0
Suhail	222 59.8	S43 26.2
Vega	80 44.9	N38 47.3
Zuben'ubi	137 15.8	S16 02.8

	A.H.S.	Pas. Mer.
	° ′	h m
Venus	260 41.0	9 27
Marte	103 40.4	19 53
Júpiter	263 46.7	9 13
Saturno	288 18.5	7 35

T.U.	SOL A.H.G.	SOL Dec.	LUNA A.H.G.	v	LUNA Dec.	d	P.H.
d h	° ′	° ′	° ′	′	° ′	′	′
8 00	178 34.9	N16 10.9	317 46.3	15.9	S 6 04.3	11.5	54.2
01	193 35.0	10.2	332 21.2	15.9	5 52.8	11.5	54.2
02	208 35.1	09.5	346 56.1	15.9	5 41.3	11.5	54.2
03	223 35.2	08.8	1 31.0	16.0	5 29.8	11.6	54.2
04	238 35.3	08.0	16 06.0	15.9	5 18.2	11.6	54.3
05	253 35.3	07.3	30 40.9	15.9	5 06.6	11.6	54.3
06	268 35.4	N16 06.6	45 15.8	16.0	S 4 55.0	11.6	54.3
07	283 35.5	05.9	59 50.8	15.9	4 43.4	11.7	54.3
08	298 35.6	05.2	74 25.7	16.0	4 31.7	11.7	54.3
09	313 35.7	04.5	89 00.7	16.0	4 20.0	11.7	54.3
10	328 35.8	03.8	103 35.7	15.9	4 08.3	11.7	54.3
11	343 35.8	03.1	118 10.6	16.0	3 56.6	11.8	54.3
12	358 35.9	N16 02.4	132 45.6	16.0	S 3 44.8	11.7	54.3
13	13 36.0	01.6	147 20.6	16.0	3 33.1	11.8	54.4
14	28 36.1	00.9	161 55.6	15.9	3 21.3	11.8	54.4
15	43 36.2	16 00.2	176 30.5	16.0	3 09.5	11.8	54.4
16	58 36.3	15 59.5	191 05.5	16.0	2 57.7	11.8	54.4
17	73 36.4	58.8	205 40.5	15.9	2 45.9	11.9	54.4
18	88 36.4	N15 58.1	220 15.4	16.0	S 2 34.0	11.8	54.4
19	103 36.5	57.3	234 50.4	16.0	2 22.2	11.9	54.4
20	118 36.6	56.6	249 25.4	15.9	2 10.3	11.9	54.5
21	133 36.7	55.9	264 00.3	16.0	1 58.4	11.9	54.5
22	148 36.8	55.2	278 35.3	15.9	1 46.5	11.9	54.5
23	163 36.9	54.5	293 10.2	16.0	1 34.6	12.0	54.5
9 00	178 37.0	N15 53.8	307 45.2	15.9	S 1 22.6	11.9	54.5
01	193 37.0	53.0	322 20.1	15.9	1 10.7	11.9	54.5
02	208 37.1	52.3	336 55.0	15.9	0 58.8	12.0	54.5
03	223 37.2	51.6	351 29.9	15.9	0 46.8	12.0	54.6
04	238 37.3	50.9	6 04.8	15.9	0 34.8	11.9	54.6
05	253 37.4	50.2	20 39.7	15.9	0 22.9	12.0	54.6
06	268 37.5	N15 49.4	35 14.6	15.9	S 0 10.9	12.0	54.6
07	283 37.6	48.7	49 49.5	15.8	N 0 01.1	12.0	54.6
08	298 37.7	48.0	64 24.3	15.9	0 13.1	12.0	54.6
09	313 37.8	47.3	78 59.2	15.8	0 25.1	12.0	54.7
10	328 37.8	46.6	93 34.0	15.8	0 37.1	12.0	54.7
11	343 37.9	45.8	108 08.8	15.7	0 49.1	12.1	54.7
12	358 38.0	N15 45.1	122 43.5	15.8	N 1 01.2	12.0	54.7
13	13 38.1	44.4	137 18.3	15.7	1 13.2	12.0	54.7
14	28 38.2	43.7	151 53.0	15.8	1 25.2	12.0	54.7
15	43 38.3	42.9	166 27.8	15.7	1 37.2	12.0	54.8
16	58 38.4	42.2	181 02.5	15.6	1 49.2	12.1	54.8
17	73 38.5	41.5	195 37.1	15.7	2 01.3	12.0	54.8
18	88 38.6	N15 40.8	210 11.8	15.6	N 2 13.3	12.0	54.8
19	103 38.7	40.0	224 46.4	15.6	2 25.3	12.0	54.8
20	118 38.8	39.3	239 21.0	15.6	2 37.3	12.1	54.9
21	133 38.8	38.6	253 55.6	15.5	2 49.4	12.0	54.9
22	148 38.9	37.8	268 30.1	15.5	3 01.4	12.0	54.9
23	163 39.0	37.1	283 04.6	15.5	3 13.4	12.0	54.9
10 00	178 39.1	N15 36.4	297 39.1	15.4	N 3 25.4	12.0	54.9
01	193 39.2	35.7	312 13.5	15.5	3 37.4	12.0	55.0
02	208 39.3	34.9	326 48.0	15.3	3 49.4	12.0	55.0
03	223 39.4	34.2	341 22.3	15.4	4 01.4	12.0	55.0
04	238 39.5	33.5	355 56.7	15.3	4 13.4	12.0	55.0
05	253 39.6	32.7	10 31.0	15.3	4 25.4	11.9	55.0
06	268 39.7	N15 32.0	25 05.3	15.2	N 4 37.3	12.0	55.1
07	283 39.8	31.3	39 39.5	15.2	4 49.3	11.9	55.1
08	298 39.9	30.5	54 13.7	15.2	5 01.2	12.0	55.1
09	313 40.0	29.8	68 47.9	15.1	5 13.2	11.9	55.1
10	328 40.1	29.1	83 22.0	15.1	5 25.1	11.9	55.2
11	343 40.2	28.3	97 56.1	15.1	5 37.0	11.9	55.2
12	358 40.3	N15 27.6	112 30.2	15.0	N 5 48.9	11.9	55.2
13	13 40.3	26.9	127 04.2	14.9	6 00.8	11.9	55.2
14	28 40.4	26.1	141 38.1	14.9	6 12.7	11.8	55.3
15	43 40.5	25.4	156 12.0	14.9	6 24.5	11.9	55.3
16	58 40.6	24.7	170 45.9	14.8	6 36.4	11.8	55.3
17	73 40.7	23.9	185 19.7	14.8	6 48.2	11.8	55.3
18	88 40.8	N15 23.2	199 53.5	14.7	N 7 00.0	11.8	55.4
19	103 40.9	22.4	214 27.2	14.7	7 11.8	11.7	55.4
20	118 41.0	21.7	229 00.9	14.6	7 23.5	11.8	55.4
21	133 41.1	21.0	243 34.5	14.6	7 35.3	11.7	55.4
22	148 41.2	20.2	258 08.1	14.5	7 47.0	11.7	55.5
23	163 41.3	19.5	272 41.6	14.4	N 7 58.7	11.7	55.5
	SD 15.8	d 0.7	SD 14.8		14.9		15.0

Lat.	Crepúsculo Náutico	Crepúsculo Civil	Orto Sol	Orto Luna 8	Orto Luna 9	Orto Luna 10	Orto Luna 11
°	h m	h m	h m	h m	h m	h m	h m
N 72	////	////	01 35	21 49	21 30	21 10	20 45
N 70	////	////	02 23	21 46	21 34	21 21	21 06
68	////	00 29	02 53	21 44	21 37	21 30	21 22
66	////	01 46	03 16	21 43	21 40	21 37	21 35
64	////	02 21	03 33	21 41	21 42	21 43	21 46
62	00 26	02 46	03 48	21 40	21 44	21 49	21 55
60	01 35	03 05	04 00	21 39	21 46	21 54	22 03
N 58	02 07	03 20	04 10	21 38	21 47	21 58	22 10
56	02 30	03 34	04 19	21 37	21 49	22 01	22 16
54	02 48	03 45	04 27	21 36	21 50	22 05	22 22
52	03 03	03 55	04 34	21 35	21 51	22 08	22 27
50	03 16	04 04	04 41	21 34	21 52	22 11	22 32
45	03 41	04 22	04 54	21 33	21 54	22 17	22 42
N 40	04 00	04 36	05 06	21 32	21 56	22 22	22 50
35	04 15	04 48	05 15	21 31	21 58	22 27	22 58
30	04 28	04 58	05 24	21 30	21 59	22 31	23 04
20	04 48	05 15	05 38	21 28	22 02	22 37	23 15
N 10	05 03	05 29	05 51	21 26	22 04	22 44	23 25
0	05 16	05 41	06 02	21 25	22 07	22 49	23 34
S 10	05 26	05 52	06 13	21 24	22 09	22 55	23 44
20	05 36	06 03	06 25	21 22	22 11	23 01	23 54
30	05 46	06 14	06 39	21 21	22 14	23 09	24 05
35	05 51	06 21	06 47	21 20	22 16	23 13	24 12
40	05 55	06 28	06 56	21 19	22 17	23 18	24 20
45	06 00	06 35	07 06	21 17	22 19	23 23	24 29
S 50	06 06	06 44	07 19	21 16	22 22	23 30	24 40
52	06 08	06 48	07 24	21 15	22 23	23 33	24 45
54	06 11	06 53	07 31	21 14	22 24	23 36	24 50
56	06 13	06 58	07 38	21 14	22 26	23 40	24 57
58	06 16	07 03	07 46	21 13	22 28	23 44	25 04
S 60	06 19	07 09	07 55	21 12	22 29	23 49	25 12

Lat.	Ocaso Sol	Crepúsculo Civil	Crepúsculo Náutico	Ocaso Luna 8	Ocaso Luna 9	Ocaso Luna 10	Ocaso Luna 11
°	h m	h m	h m	h m	h m	h m	h m
N 72	22 27	////	////	08 05	09 52	11 40	13 37
N 70	21 43	////	////	08 12	09 51	11 32	13 19
68	21 14	23 21	////	08 17	09 50	11 25	13 04
66	20 52	22 19	////	08 22	09 50	11 19	12 53
64	20 35	21 46	////	08 25	09 49	11 15	12 43
62	20 21	21 22	23 26	08 29	09 49	11 11	12 35
60	20 10	21 04	22 31	08 32	09 49	11 07	12 28
N 58	19 59	20 48	22 01	08 34	09 48	11 04	12 22
56	19 50	20 36	21 38	08 36	09 48	11 01	12 16
54	19 43	20 24	21 21	08 38	09 48	10 59	12 11
52	19 36	20 15	21 06	08 40	09 48	10 56	12 07
50	19 29	20 06	20 54	08 42	09 48	10 54	12 03
45	19 16	19 48	20 29	08 45	09 47	10 50	11 54
N 40	19 05	19 34	20 10	08 48	09 47	10 46	11 47
35	18 55	19 22	19 55	08 51	09 46	10 43	11 41
30	18 47	19 12	19 43	08 53	09 46	10 40	11 36
20	18 33	18 56	19 23	08 57	09 46	10 35	11 26
N 10	18 20	18 42	19 08	09 01	09 45	10 31	11 18
0	18 09	18 30	18 55	09 04	09 45	10 27	11 11
S 10	17 58	18 19	18 45	09 07	09 45	10 23	11 03
20	17 46	18 08	18 35	09 10	09 44	10 19	10 55
30	17 32	17 57	18 25	09 14	09 44	10 14	10 46
35	17 24	17 51	18 21	09 16	09 43	10 11	10 41
40	17 16	17 44	18 16	09 18	09 43	10 08	10 35
45	17 05	17 36	18 11	09 21	09 42	10 04	10 28
S 50	16 53	17 27	18 06	09 24	09 42	10 00	10 19
52	16 47	17 23	18 03	09 26	09 42	09 58	10 16
54	16 41	17 19	18 01	09 28	09 41	09 56	10 12
56	16 34	17 14	17 59	09 29	09 41	09 53	10 07
58	16 26	17 09	17 56	09 31	09 41	09 51	10 02
S 60	16 17	17 03	17 53	09 34	09 41	09 48	09 56

Dia	SOL E.T. (−) 00h	SOL E.T. (−) 12h	SOL Pas. Mer.	LUNA Pas. Sup.	LUNA Mer. Inf.	LUNA Edad	LUNA Fase
d	m s	m s	h m	h m	h m	d	%
8	05 40	05 36	12 06	02 54	15 14	19	84
9	05 32	05 28	12 05	03 35	15 56	20	77
10	05 24	05 19	12 05	04 17	16 38	21	68

T.U.	ARIES	VENUS −4.0		MARTE −1.3		JUPITER −2.0		SATURNO +0.1	
d h	A.H.G.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.
	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
11 00	319 31.5	217 42.1	N21 49.4	62 35.9	S26 57.0	222 52.3	N23 03.5	247 39.9	N20 38.9
01	334 33.9	232 41.4	49.3	77 37.6	57.0	237 54.3	03.5	262 42.2	39.0
02	349 36.4	247 40.8	49.2	92 39.3	57.0	252 56.2	03.5	277 44.4	39.0
03	4 38.9	262 40.1 . .	49.1	107 41.0 . .	57.1	267 58.1 . .	03.4	292 46.7 . .	39.0
04	19 41.3	277 39.4	49.0	122 42.6	57.1	283 00.0	03.4	307 49.0	39.0
05	34 43.8	292 38.7	48.9	137 44.3	57.1	298 02.0	03.4	322 51.2	39.0
06	49 46.2	307 38.1	N21 48.8	152 46.0	S26 57.1	313 03.9	N23 03.4	337 53.5	N20 39.1
07	64 48.7	322 37.4	48.7	167 47.7	57.1	328 05.8	03.4	352 55.7	39.1
S 08	79 51.2	337 36.7	48.6	182 49.3	57.2	343 07.8	03.3	7 58.0	39.1
A 09	94 53.6	352 36.0 . .	48.4	197 51.0 . .	57.2	358 09.7 . .	03.3	23 00.3 . .	39.1
10	109 56.1	7 35.4	48.3	212 52.7	57.2	13 11.6	03.3	38 02.5	39.1
B 11	124 58.6	22 34.7	48.2	227 54.4	57.2	28 13.6	03.3	53 04.8	39.2
A 12	140 01.0	37 34.0	N21 48.1	242 56.0	S26 57.2	43 15.5	N23 03.3	68 07.0	N20 39.2
13	155 03.5	52 33.4	48.0	257 57.7	57.3	58 17.4	03.2	83 09.3	39.2
D 14	170 06.0	67 32.7	47.9	272 59.4	57.3	73 19.4	03.2	98 11.6	39.2
15	185 08.4	82 32.0 . .	47.8	288 01.0 . .	57.3	88 21.3 . .	03.2	113 13.8 . .	39.2
O 16	200 10.9	97 31.3	47.7	303 02.7	57.3	103 23.2	03.2	128 16.1	39.2
17	215 13.3	112 30.7	47.5	318 04.4	57.3	118 25.1	03.2	143 18.3	39.3
18	230 15.8	127 30.0	N21 47.4	333 06.0	S26 57.4	133 27.1	N23 03.1	158 20.6	N20 39.3
19	245 18.3	142 29.3	47.3	348 07.7	57.4	148 29.0	03.1	173 22.9	39.3
20	260 20.7	157 28.6	47.2	3 09.4	57.4	163 30.9	03.1	188 25.1	39.3
21	275 23.2	172 28.0 . .	47.1	18 11.0 . .	57.4	178 32.9 . .	03.1	203 27.4 . .	39.3
22	290 25.7	187 27.3	46.9	33 12.7	57.5	193 34.8	03.1	218 29.6	39.4
23	305 28.1	202 26.6	46.8	48 14.3	57.5	208 36.7	03.0	233 31.9	39.4
12 00	320 30.6	217 25.9	N21 46.7	63 16.0	S26 57.5	223 38.7	N23 03.0	248 34.2	N20 39.4
01	335 33.1	232 25.3	46.6	78 17.6	57.5	238 40.6	03.0	263 36.4	39.4
02	350 35.5	247 24.6	46.4	93 19.3	57.5	253 42.5	03.0	278 38.7	39.4
03	5 38.0	262 23.9 . .	46.3	108 20.9 . .	57.6	268 44.5 . .	03.0	293 41.0 . .	39.5
04	20 40.5	277 23.2	46.2	123 22.6	57.6	283 46.4	02.9	308 43.2	39.5
05	35 42.9	292 22.6	46.0	138 24.3	57.6	298 48.3	02.9	323 45.5	39.5
06	50 45.4	307 21.9	N21 45.9	153 25.9	S26 57.6	313 50.3	N23 02.9	338 47.7	N20 39.5
07	65 47.8	322 21.2	45.8	168 27.5	57.6	328 52.2	02.9	353 50.0	39.5
D 08	80 50.3	337 20.5	45.6	183 29.2	57.7	343 54.1	02.9	8 52.3	39.6
O 09	95 52.8	352 19.9 . .	45.5	198 30.8 . .	57.7	358 56.1 . .	02.8	23 54.5 . .	39.6
M 10	110 55.2	7 19.2	45.4	213 32.5	57.7	13 58.0	02.8	38 56.8	39.6
11	125 57.7	22 18.5	45.2	228 34.1	57.7	29 00.0	02.8	53 59.1	39.6
I 12	141 00.2	37 17.8	N21 45.1	243 35.8	S26 57.7	44 01.9	N23 02.8	69 01.3	N20 39.6
N 13	156 02.6	52 17.2	45.0	258 37.4	57.8	59 03.8	02.8	84 03.6	39.7
14	171 05.1	67 16.5	44.8	273 39.0	57.8	74 05.8	02.7	99 05.8	39.7
G 15	186 07.6	82 15.8 . .	44.7	288 40.7 . .	57.8	89 07.7 . .	02.7	114 08.1 . .	39.7
O 16	201 10.0	97 15.1	44.5	303 42.3	57.8	104 09.6	02.7	129 10.4	39.7
17	216 12.5	112 14.5	44.4	318 44.0	57.8	119 11.6	02.7	144 12.6	39.7
18	231 15.0	127 13.8	N21 44.3	333 45.6	S26 57.9	134 13.5	N23 02.7	159 14.9	N20 39.7
19	246 17.4	142 13.1	44.1	348 47.2	57.9	149 15.4	02.6	174 17.2	39.8
20	261 19.9	157 12.4	44.0	3 48.9	57.9	164 17.4	02.6	189 19.4	39.8
21	276 22.3	172 11.8 . .	43.8	18 50.5 . .	57.9	179 19.3 . .	02.6	204 21.7 . .	39.8
22	291 24.8	187 11.1	43.7	33 52.1	57.9	194 21.2	02.6	219 24.0	39.8
23	306 27.3	202 10.4	43.5	48 53.7	58.0	209 23.2	02.6	234 26.2	39.8
13 00	321 29.7	217 09.7	N21 43.4	63 55.4	S26 58.0	224 25.1	N23 02.5	249 28.5	N20 39.9
01	336 32.2	232 09.0	43.2	78 57.0	58.0	239 27.1	02.5	264 30.8	39.9
02	351 34.7	247 08.4	43.1	93 58.6	58.0	254 29.0	02.5	279 33.0	39.9
03	6 37.1	262 07.7 . .	42.9	109 00.3 . .	58.0	269 30.9 . .	02.5	294 35.3 . .	39.9
04	21 39.6	277 07.0	42.8	124 01.9	58.1	284 32.9	02.5	309 37.5	39.9
05	36 42.1	292 06.3	42.6	139 03.5	58.1	299 34.8	02.4	324 39.8	40.0
06	51 44.5	307 05.7	N21 42.5	154 05.1	S26 58.1	314 36.7	N23 02.4	339 42.1	N20 40.0
07	66 47.0	322 05.0	42.3	169 06.7	58.1	329 38.7	02.4	354 44.3	40.0
L 08	81 49.4	337 04.3	42.1	184 08.4	58.1	344 40.6	02.4	9 46.6	40.0
U 09	96 51.9	352 03.6 . .	42.0	199 10.0 . .	58.2	359 42.6 . .	02.3	24 48.9 . .	40.0
10	111 54.4	7 03.0	41.8	214 11.6	58.2	14 44.5	02.3	39 51.1	40.0
N 11	126 56.8	22 02.3	41.7	229 13.2	58.2	29 46.4	02.3	54 53.4	40.1
12	141 59.3	37 01.6	N21 41.5	244 14.8	S26 58.2	44 48.4	N23 02.3	69 55.7	N20 40.1
E 13	157 01.8	52 00.9	41.3	259 16.4	58.2	59 50.3	02.3	84 57.9	40.1
14	172 04.2	67 00.2	41.2	274 18.0	58.3	74 52.2	02.2	100 00.2	40.1
S 15	187 06.7	81 59.6 . .	41.0	289 19.6 . .	58.3	89 54.2 . .	02.2	115 02.5 . .	40.1
16	202 09.2	96 58.9	40.8	304 21.3	58.3	104 56.1	02.2	130 04.8	40.2
17	217 11.6	111 58.2	40.7	319 22.9	58.3	119 58.1	02.2	145 07.0	40.2
18	232 14.1	126 57.5	N21 40.5	334 24.5	S26 58.3	135 00.0	N23 02.2	160 09.3	N20 40.2
19	247 16.6	141 56.9	40.3	349 26.1	58.3	150 01.9	02.1	175 11.6	40.2
20	262 19.0	156 56.2	40.2	4 27.7	58.4	165 03.9	02.1	190 13.8	40.2
21	277 21.5	171 55.5 . .	40.0	19 29.3 . .	58.4	180 05.8 . .	02.1	205 16.1 . .	40.2
22	292 23.9	186 54.8	39.8	34 30.9	58.4	195 07.8	02.1	220 18.4	40.3
23	307 26.4	201 54.1	39.7	49 32.5	58.4	210 09.7	02.1	235 20.6	40.3
Pas. Mer.	h m 2 37.5	v −0.7	d 0.1	v 1.6	d 0.0	v 1.9	d 0.0	v 2.3	d 0.0

ESTRELLAS		
Nombre	A.H.S.	Dec.
	° ′	° ′
Acamar	315 25.3	S40 17.7
Achernar	335 33.3	S57 13.5
Acrux	173 20.3	S63 06.5
Adhara	255 20.2	S28 58.3
Aldebaran	291 00.2	N16 30.7
Alioth	166 29.1	N55 57.5
Alkaid	153 06.3	N49 18.7
Al Na'ir	27 54.8	S46 57.2
Alnilam	275 56.0	S 1 12.0
Alphard	218 05.6	S 8 39.8
Alphecca	126 18.8	N26 42.9
Alpheratz	357 52.9	N29 05.8
Altair	62 17.0	N 8 52.4
Ankaa	353 24.5	S42 17.7
Antares	112 37.6	S26 26.1
Arcturus	146 04.3	N19 10.7
Atria	107 47.6	S69 02.0
Avior	234 22.5	S59 30.7
Bellatrix	278 42.2	N 6 21.1
Betelgeuse	271 11.6	N 7 24.5
Canopus	264 00.7	S52 41.6
Capella	280 48.5	N45 59.8
Deneb	49 37.4	N45 17.2
Denebola	182 43.4	N14 34.0
Diphda	349 05.0	S17 58.6
Dubhe	194 03.5	N61 44.8
Elnath	278 24.6	N28 36.5
Eltanin	90 50.1	N51 29.6
Enif	33 55.9	N 9 53.0
Fomalhaut	15 33.8	S29 36.8
Gacrux	172 11.8	S57 07.4
Gienah	176 02.1	S17 32.9
Hadar	149 01.4	S60 23.0
Hamal	328 11.2	N23 28.1
Kaus Aust.	83 55.8	S34 23.1
Kochab	137 19.6	N74 09.4
Markab	13 47.3	N15 12.8
Menkar	314 24.8	N 4 05.8
Menkent	148 18.7	S36 22.7
Miaplacidus	221 42.7	S69 43.3
Mirfak	308 53.8	N49 51.8
Nunki	76 09.5	S26 17.7
Peacock	53 33.2	S56 43.8
Pollux	243 39.4	N28 01.4
Procyon	245 09.8	N 5 13.4
Rasalhague	96 14.9	N12 33.7
Regulus	207 53.7	N11 57.8
Rigel	281 21.2	S 8 11.9
Rigil Kent.	140 04.8	S60 50.6
Sabik	102 23.1	S15 43.6
Schedar	349 50.9	N56 32.5
Shaula	96 34.3	S37 06.3
Sirius	258 42.2	S16 42.9
Spica	158 41.2	S11 10.0
Suhail	222 59.8	S43 26.2
Vega	80 44.9	N38 47.3
Zuben'ubi	137 15.8	S16 02.8

	A.H.S.	Pas. Mer.
	° ′	h m
Venus	256 55.3	9 31
Marte	102 45.4	19 45
Júpiter	263 08.1	9 04
Saturno	288 03.6	7 25

T.U.	SOL				LUNA					
	A.H.G.		Dec.		A.H.G.	v	Dec.	d	P.H.	
d h	°	′	°	′	°	′	°	′	′	′
11 00	178	41.4	N15	18.8	287	15.0	14.4	N 8 10.4	11.6	55.5
01	193	41.5		18.0	301	48.4	14.4	8 22.0	11.7	55.5
02	208	41.6		17.3	316	21.8	14.3	8 33.7	11.6	55.6
03	223	41.7	. .	16.5	330	55.1	14.2	8 45.3	11.6	55.6
04	238	41.8		15.8	345	28.3	14.2	8 56.9	11.5	55.6
05	253	41.9		15.1	0	01.5	14.1	9 08.4	11.5	55.6
06	268	42.0	N15	14.3	14	34.6	14.1	N 9 19.9	11.5	55.7
07	283	42.1		13.6	29	07.7	14.0	9 31.4	11.5	55.7
S 08	298	42.2		12.8	43	40.7	13.9	9 42.9	11.4	55.7
A 09	313	42.3	. .	12.1	58	13.6	13.9	9 54.3	11.4	55.8
B 10	328	42.4		11.3	72	46.5	13.8	10 05.7	11.4	55.8
A 11	343	42.5		10.6	87	19.3	13.7	10 17.1	11.3	55.8
D 12	358	42.6	N15	09.8	101	52.0	13.7	N10 28.4	11.4	55.9
O 13	13	42.7		09.1	116	24.7	13.6	10 39.8	11.2	55.9
14	28	42.8		08.4	130	57.3	13.5	10 51.0	11.3	55.9
15	43	42.9	. .	07.6	145	29.8	13.5	11 02.3	11.1	55.9
16	58	43.0		06.9	160	02.3	13.4	11 13.4	11.2	56.0
17	73	43.1		06.1	174	34.7	13.3	11 24.6	11.1	56.0
18	88	43.2	N15	05.4	189	07.0	13.2	N11 35.7	11.1	56.0
19	103	43.3		04.6	203	39.2	13.2	11 46.8	11.0	56.1
20	118	43.4		03.9	218	11.4	13.1	11 57.8	11.0	56.1
21	133	43.5	. .	03.1	232	43.5	13.0	12 08.8	11.0	56.1
22	148	43.7		02.4	247	15.5	13.0	12 19.8	10.9	56.2
23	163	43.8		01.6	261	47.5	12.8	12 30.7	10.8	56.2
12 00	178	43.9	N15	00.9	276	19.3	12.8	N12 41.5	10.9	56.2
01	193	44.0	15	00.1	290	51.1	12.7	12 52.4	10.7	56.3
02	208	44.1	14	59.4	305	22.8	12.7	13 03.1	10.8	56.3
03	223	44.2	. .	58.6	319	54.5	12.5	13 13.9	10.6	56.3
04	238	44.3		57.9	334	26.0	12.5	13 24.5	10.6	56.4
05	253	44.4		57.1	348	57.5	12.4	13 35.1	10.6	56.4
06	268	44.5	N14	56.4	3	28.9	12.3	N13 45.7	10.5	56.4
07	283	44.6		55.6	18	00.2	12.2	13 56.2	10.5	56.5
D 08	298	44.7		54.9	32	31.4	12.1	14 06.7	10.4	56.5
O 09	313	44.8	. .	54.1	47	02.5	12.1	14 17.1	10.4	56.5
M 10	328	44.9		53.4	61	33.6	11.9	14 27.5	10.2	56.6
I 11	343	45.0		52.6	76	04.5	11.9	14 37.7	10.3	56.6
N 12	358	45.1	N14	51.9	90	35.4	11.8	N14 48.0	10.2	56.6
G 13	13	45.2		51.1	105	06.2	11.7	14 58.2	10.1	56.7
O 14	28	45.3		50.3	119	36.9	11.6	15 08.3	10.0	56.7
15	43	45.5	. .	49.6	134	07.5	11.5	15 18.3	10.0	56.7
16	58	45.6		48.8	148	38.0	11.4	15 28.3	10.0	56.8
17	73	45.7		48.1	163	08.4	11.3	15 38.3	9.8	56.8
18	88	45.8	N14	47.3	177	38.7	11.3	N15 48.1	9.8	56.8
19	103	45.9		46.6	192	09.0	11.1	15 57.9	9.7	56.9
20	118	46.0		45.8	206	39.1	11.1	16 07.6	9.7	56.9
21	133	46.1	. .	45.0	221	09.2	10.9	16 17.3	9.6	56.9
22	148	46.2		44.3	235	39.1	10.9	16 26.9	9.5	57.0
23	163	46.3		43.5	250	09.0	10.7	16 36.4	9.5	57.0
13 00	178	46.4	N14	42.8	264	38.7	10.7	N16 45.9	9.3	57.1
01	193	46.5		42.0	279	08.4	10.6	16 55.2	9.3	57.1
02	208	46.7		41.2	293	38.0	10.4	17 04.5	9.2	57.1
03	223	46.8	. .	40.5	308	07.4	10.4	17 13.7	9.2	57.2
04	238	46.9		39.7	322	36.8	10.3	17 22.9	9.0	57.2
05	253	47.0		39.0	337	06.1	10.1	17 31.9	9.0	57.2
06	268	47.1	N14	38.2	351	35.2	10.1	N17 40.9	8.9	57.3
07	283	47.2		37.4	6	04.3	10.0	17 49.8	8.8	57.3
08	298	47.3		36.7	20	33.3	9.9	17 58.6	8.8	57.4
L 09	313	47.4	. .	35.9	35	02.2	9.7	18 07.4	8.6	57.4
U 10	328	47.5		35.2	49	30.9	9.7	18 16.0	8.6	57.4
N 11	343	47.7		34.4	63	59.6	9.6	18 24.6	8.5	57.5
E 12	358	47.8	N14	33.6	78	28.2	9.4	N18 33.1	8.3	57.5
S 13	13	47.9		32.9	92	56.6	9.4	18 41.4	8.3	57.5
14	28	48.0		32.1	107	25.0	9.2	18 49.7	8.2	57.6
15	43	48.1	. .	31.3	121	53.2	9.2	18 57.9	8.1	57.6
16	58	48.2		30.6	136	21.4	9.1	19 06.0	8.1	57.7
17	73	48.3		29.8	150	49.5	8.9	19 14.1	7.9	57.7
18	88	48.4	N14	29.0	165	17.4	8.8	N19 22.0	7.8	57.7
19	103	48.6		28.3	179	45.2	8.8	19 29.8	7.7	57.8
20	118	48.7		27.5	194	13.0	8.6	19 37.5	7.6	57.8
21	133	48.8	. .	26.7	208	40.6	8.6	19 45.1	7.5	57.9
22	148	48.9		26.0	223	08.2	8.4	19 52.6	7.4	57.9
23	163	49.0		25.2	237	35.6	8.3	N20 00.0	7.4	57.9
	SD	15.8	d	0.8	SD		15.2	15.4		15.7

Lat.	Crepúsculo Náutico	Crepúsculo Civil	Orto Sol	Orto Luna 11	Orto Luna 12	Orto Luna 13	Orto Luna 14
°	h m	h m	h m	h m	h m	h m	h m
N 72	////	////	02 02	20 45	20 05	▭	▭
N 70	////	////	02 40	21 06	20 45	19 57	▭
68	////	01 16	03 07	21 22	21 12	20 58	19 55
66	////	02 04	03 27	21 35	21 33	21 33	21 37
64	////	02 34	03 43	21 46	21 50	21 58	22 15
62	01 08	02 56	03 56	21 55	22 04	22 18	22 42
60	01 51	03 14	04 07	22 03	22 16	22 34	23 04
N 58	02 19	03 28	04 17	22 10	22 26	22 48	23 21
56	02 39	03 40	04 25	22 16	22 35	23 00	23 36
54	02 56	03 51	04 32	22 22	22 43	23 11	23 48
52	03 10	04 00	04 39	22 27	22 50	23 20	24 00
50	03 22	04 09	04 45	22 32	22 57	23 28	24 10
45	03 46	04 26	04 58	22 42	23 11	23 46	24 30
N 40	04 04	04 39	05 09	22 50	23 23	24 01	00 01
35	04 18	04 51	05 18	22 58	23 33	24 13	00 13
30	04 30	05 00	05 26	23 04	23 41	24 24	00 24
20	04 49	05 16	05 39	23 15	23 57	24 43	00 43
N 10	05 03	05 29	05 51	23 25	24 10	00 10	01 00
0	05 15	05 40	06 02	23 34	24 23	00 23	01 15
S 10	05 26	05 51	06 12	23 44	24 35	00 35	01 31
20	05 35	06 01	06 24	23 54	24 49	00 49	01 47
30	05 43	06 12	06 36	24 05	00 05	01 05	02 07
35	05 48	06 18	06 44	24 12	00 12	01 14	02 18
40	05 52	06 24	06 52	24 20	00 20	01 24	02 31
45	05 56	06 31	07 02	24 29	00 29	01 37	02 46
S 50	06 01	06 39	07 13	24 40	00 40	01 52	03 05
52	06 03	06 43	07 19	24 45	00 45	01 59	03 14
54	06 05	06 47	07 25	24 50	00 50	02 07	03 25
56	06 07	06 52	07 31	24 57	00 57	02 16	03 36
58	06 10	06 56	07 39	25 04	01 04	02 26	03 49
S 60	06 12	07 02	07 47	25 12	01 12	02 37	04 05

Lat.	Ocaso Sol	Crepúsculo Civil	Crepúsculo Náutico	Ocaso Luna 11	Ocaso Luna 12	Ocaso Luna 13	Ocaso Luna 14
°	h m	h m	h m	h m	h m	h m	h m
N 72	22 01	////	////	13 37	15 56	▭	▭
N 70	21 25	////	////	13 19	15 18	17 51	▭
68	21 00	22 45	////	13 04	14 52	16 52	19 51
66	20 41	22 01	////	12 53	14 32	16 18	18 10
64	20 25	21 32	////	12 43	14 16	15 53	17 31
62	20 12	21 11	22 54	12 35	14 03	15 34	17 05
60	20 01	20 54	22 14	12 28	13 52	15 18	16 44
N 58	19 52	20 40	21 48	12 22	13 42	15 05	16 27
56	19 44	20 28	21 28	12 16	13 34	14 53	16 12
54	19 36	20 17	21 12	12 11	13 26	14 43	16 00
52	19 30	20 08	20 58	12 07	13 20	14 35	15 49
50	19 24	20 00	20 47	12 03	13 14	14 27	15 39
45	19 11	19 43	20 23	11 54	13 01	14 10	15 19
N 40	19 01	19 30	20 05	11 47	12 50	13 56	15 03
35	18 52	19 19	19 51	11 41	12 41	13 44	14 49
30	18 44	19 09	19 39	11 36	12 33	13 34	14 37
20	18 31	18 54	19 21	11 26	12 20	13 17	14 16
N 10	18 19	18 41	19 06	11 18	12 08	13 01	13 58
0	18 08	18 30	18 55	11 11	11 57	12 47	13 42
S 10	17 58	18 19	18 45	11 03	11 46	12 33	13 25
20	17 47	18 09	18 35	10 55	11 34	12 18	13 07
30	17 34	17 59	18 27	10 46	11 21	12 01	12 47
35	17 27	17 53	18 23	10 41	11 13	11 51	12 35
40	17 18	17 46	18 19	10 35	11 05	11 39	12 21
45	17 09	17 39	18 14	10 28	10 54	11 26	12 05
S 50	16 57	17 31	18 10	10 19	10 42	11 10	11 45
52	16 52	17 28	18 08	10 16	10 36	11 02	11 36
54	16 46	17 24	18 06	10 12	10 30	10 54	11 26
56	16 39	17 19	18 03	10 07	10 23	10 44	11 14
58	16 32	17 14	18 01	10 02	10 15	10 34	11 00
S 60	16 24	17 09	17 59	09 56	10 07	10 21	10 44

Día	SOL E.T. (−) 00h	SOL E.T. (−) 12h	SOL Pas. Mer.	LUNA Pas. Mer. Sup.	LUNA Pas. Mer. Inf.	LUNA Edad	LUNA Fase
d	m s	m s	h m	h m	h m	d	%
11	05 15	05 10	12 05	05 00	17 22	22	59
12	05 05	05 00	12 05	05 46	18 10	23	48
13	04 54	04 49	12 05	06 35	19 01	24	38

T.U.	ARIES	VENUS −4.0		MARTE −1.2		JUPITER −2.0		SATURNO +0.1	
	A.H.G.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
14 00	322 28.9	216 53.5	N21 39.5	64 34.1	S26 58.4	225 11.6	N23 02.0	250 22.9	N20 40.3
01	337 31.3	231 52.8	39.3	79 35.7	58.5	240 13.6	02.0	265 25.2	40.3
02	352 33.8	246 52.1	39.1	94 37.3	58.5	255 15.5	02.0	280 27.4	40.3
03	7 36.3	261 51.4	. . 39.0	109 38.9	. . 58.5	270 17.5	. . 02.0	295 29.7	. . 40.4
04	22 38.7	276 50.7	38.8	124 40.5	58.5	285 19.4	01.9	310 32.0	40.4
05	37 41.2	291 50.1	38.6	139 42.1	58.5	300 21.3	01.9	325 34.2	40.4
06	52 43.7	306 49.4	N21 38.4	154 43.6	S26 58.6	315 23.3	N23 01.9	340 36.5	N20 40.4
07	67 46.1	321 48.7	38.2	169 45.2	58.6	330 25.2	01.9	355 38.8	40.4
M 08	82 48.6	336 48.0	38.1	184 46.8	58.6	345 27.2	01.9	10 41.1	40.4
09	97 51.1	351 47.4	. . 37.9	199 48.4	. . 58.6	0 29.1	. . 01.8	25 43.3	. . 40.5
A 10	112 53.5	6 46.7	37.7	214 50.0	58.6	15 31.0	01.8	40 45.6	40.5
R 11	127 56.0	21 46.0	37.5	229 51.6	58.7	30 33.0	01.8	55 47.9	40.5
T 12	142 58.4	36 45.3	N21 37.3	244 53.2	S26 58.7	45 34.9	N23 01.8	70 50.1	N20 40.5
13	158 00.9	51 44.6	37.1	259 54.8	58.7	60 36.9	01.8	85 52.4	40.5
E 14	173 03.4	66 44.0	36.9	274 56.3	58.7	75 38.8	01.7	100 54.7	40.6
15	188 05.8	81 43.3	. . 36.7	289 57.9	. . 58.7	90 40.8	. . 01.7	115 56.9	. . 40.6
S 16	203 08.3	96 42.6	36.6	304 59.5	58.7	105 42.7	01.7	130 59.2	40.6
17	218 10.8	111 41.9	36.4	320 01.1	58.8	120 44.6	01.7	146 01.5	40.6
18	233 13.2	126 41.2	N21 36.2	335 02.7	S26 58.8	135 46.6	N23 01.6	161 03.8	N20 40.6
19	248 15.7	141 40.6	36.0	350 04.2	58.8	150 48.5	01.6	176 06.0	40.6
20	263 18.2	156 39.9	35.8	5 05.8	58.8	165 50.5	01.6	191 08.3	40.7
21	278 20.6	171 39.2	. . 35.6	20 07.4	. . 58.8	180 52.4	. . 01.6	206 10.6	. . 40.7
22	293 23.1	186 38.5	35.4	35 09.0	58.9	195 54.4	01.6	221 12.8	40.7
23	308 25.6	201 37.8	35.2	50 10.5	58.9	210 56.3	01.5	236 15.1	40.7
15 00	323 28.0	216 37.2	N21 35.0	65 12.1	S26 58.9	225 58.2	N23 01.5	251 17.4	N20 40.7
01	338 30.5	231 36.5	34.8	80 13.7	58.9	241 00.2	01.5	266 19.7	40.7
02	353 32.9	246 35.8	34.6	95 15.2	58.9	256 02.1	01.5	281 21.9	40.8
03	8 35.4	261 35.1	. . 34.4	110 16.8	. . 59.0	271 04.1	. . 01.4	296 24.2	. . 40.8
04	23 37.9	276 34.5	34.2	125 18.4	59.0	286 06.0	01.4	311 26.5	40.8
05	38 40.3	291 33.8	34.0	140 19.9	59.0	301 08.0	01.4	326 28.8	40.8
06	53 42.8	306 33.1	N21 33.8	155 21.5	S26 59.0	316 09.9	N23 01.4	341 31.0	N20 40.8
M 07	68 45.3	321 32.4	33.6	170 23.1	59.0	331 11.8	01.4	356 33.3	40.9
I 08	83 47.7	336 31.7	33.4	185 24.6	59.0	346 13.8	01.3	11 35.6	40.9
E 09	98 50.2	351 31.1	. . 33.2	200 26.2	. . 59.1	1 15.7	. . 01.3	26 37.9	. . 40.9
R 10	113 52.7	6 30.4	32.9	215 27.7	59.1	16 17.7	01.3	41 40.1	40.9
C 11	128 55.1	21 29.7	32.7	230 29.3	59.1	31 19.6	01.3	56 42.4	40.9
O 12	143 57.6	36 29.0	N21 32.5	245 30.9	S26 59.1	46 21.6	N23 01.3	71 44.7	N20 40.9
L 13	159 00.0	51 28.3	32.3	260 32.4	59.1	61 23.5	01.2	86 46.9	41.0
E 14	174 02.5	66 27.7	32.1	275 34.0	59.2	76 25.5	01.2	101 49.2	41.0
S 15	189 05.0	81 27.0	. . 31.9	290 35.5	. . 59.2	91 27.4	. . 01.2	116 51.5	. . 41.0
16	204 07.4	96 26.3	31.7	305 37.1	59.2	106 29.4	01.2	131 53.8	41.0
17	219 09.9	111 25.6	31.5	320 38.6	59.2	121 31.3	01.1	146 56.0	41.0
18	234 12.4	126 24.9	N21 31.2	335 40.2	S26 59.2	136 33.2	N23 01.1	161 58.3	N20 41.0
19	249 14.8	141 24.3	31.0	350 41.7	59.2	151 35.2	01.1	177 00.6	41.1
20	264 17.3	156 23.6	30.8	5 43.3	59.3	166 37.1	01.1	192 02.9	41.1
21	279 19.8	171 22.9	. . 30.6	20 44.8	. . 59.3	181 39.1	. . 01.1	207 05.1	. . 41.1
22	294 22.2	186 22.2	30.4	35 46.4	59.3	196 41.0	01.0	222 07.4	41.1
23	309 24.7	201 21.5	30.1	50 47.9	59.3	211 43.0	01.0	237 09.7	41.1
16 00	324 27.2	216 20.9	N21 29.9	65 49.5	S26 59.3	226 44.9	N23 01.0	252 12.0	N20 41.1
01	339 29.6	231 20.2	29.7	80 51.0	59.3	241 46.9	01.0	267 14.3	41.2
02	354 32.1	246 19.5	29.5	95 52.5	59.4	256 48.8	00.9	282 16.5	41.2
03	9 34.5	261 18.8	. . 29.2	110 54.1	. . 59.4	271 50.8	. . 00.9	297 18.8	. . 41.2
04	24 37.0	276 18.1	29.0	125 55.6	59.4	286 52.7	00.9	312 21.1	41.2
05	39 39.5	291 17.5	28.8	140 57.2	59.4	301 54.7	00.9	327 23.4	41.2
06	54 41.9	306 16.8	N21 28.5	155 58.7	S26 59.4	316 56.6	N23 00.9	342 25.6	N20 41.2
07	69 44.4	321 16.1	28.3	171 00.2	59.4	331 58.6	00.8	357 27.9	41.3
J 08	84 46.9	336 15.4	28.1	186 01.8	59.5	347 00.5	00.8	12 30.2	41.3
U 09	99 49.3	351 14.7	. . 27.8	201 03.3	. . 59.5	2 02.5	. . 00.8	27 32.5	. . 41.3
E 10	114 51.8	6 14.1	27.6	216 04.8	59.5	17 04.4	00.8	42 34.7	41.3
V 11	129 54.3	21 13.4	27.4	231 06.4	59.5	32 06.4	00.7	57 37.0	41.3
E 12	144 56.7	36 12.7	N21 27.1	246 07.9	S26 59.5	47 08.3	N23 00.7	72 39.3	N20 41.4
13	159 59.2	51 12.0	26.9	261 09.4	59.6	62 10.3	00.7	87 41.6	41.4
S 14	175 01.7	66 11.3	26.7	276 10.9	59.6	77 12.2	00.7	102 43.9	41.4
15	190 04.1	81 10.7	. . 26.4	291 12.5	. . 59.6	92 14.2	. . 00.6	117 46.1	. . 41.4
16	205 06.6	96 10.0	26.2	306 14.0	59.6	107 16.1	00.6	132 48.4	41.4
17	220 09.0	111 09.3	25.9	321 15.5	59.6	122 18.1	00.6	147 50.7	41.4
18	235 11.5	126 08.6	N21 25.7	336 17.0	S26 59.6	137 20.0	N23 00.6	162 53.0	N20 41.5
19	250 14.0	141 07.9	25.5	351 18.6	59.7	152 22.0	00.6	177 55.3	41.5
20	265 16.4	156 07.3	25.2	6 20.1	59.7	167 23.9	00.5	192 57.5	41.5
21	280 18.9	171 06.6	. . 25.0	21 21.6	. . 59.7	182 25.9	. . 00.5	207 59.8	. . 41.5
22	295 21.4	186 05.9	24.7	36 23.1	59.7	197 27.8	00.5	223 02.1	41.5
23	310 23.8	201 05.2	24.5	51 24.6	59.7	212 29.8	00.5	238 04.4	41.5
	h m								
Pas. Mer.	2 25.7	v −0.7	d 0.2	v 1.6	d 0.0	v 1.9	d 0.0	v 2.3	d 0.0

ESTRELLAS

Nombre	A.H.S.	Dec.
	° ′	° ′
Acamar	315 25.3	S40 17.7
Achernar	335 33.3	S57 13.5
Acrux	173 20.4	S63 06.5
Adhara	255 20.1	S28 58.3
Aldebaran	291 00.2	N16 30.7
Alioth	166 29.1	N55 57.4
Alkaid	153 06.3	N49 18.7
Al Na'ir	27 54.8	S46 57.2
Alnilam	275 56.0	S 1 12.0
Alphard	218 05.6	S 8 39.8
Alphecca	126 18.8	N26 42.9
Alpheratz	357 52.9	N29 05.8
Altair	62 17.0	N 8 52.4
Ankaa	353 24.5	S42 17.7
Antares	112 37.6	S26 26.1
Arcturus	146 04.3	N19 10.7
Atria	107 47.6	S69 02.0
Avior	234 22.5	S59 30.7
Bellatrix	278 42.2	N 6 21.1
Betelgeuse	271 11.6	N 7 24.5
Canopus	264 00.7	S52 41.5
Capella	280 48.4	N45 59.8
Deneb	49 37.4	N45 17.2
Denebola	182 43.4	N14 34.0
Diphda	349 05.0	S17 58.6
Dubhe	194 03.5	N61 44.8
Elnath	278 24.6	N28 36.5
Eltanin	90 50.1	N51 29.6
Enif	33 55.9	N 9 53.0
Fomalhaut	15 33.8	S29 36.8
Gacrux	172 11.8	S57 07.4
Gienah	176 02.1	S17 32.9
Hadar	149 01.5	S60 23.0
Hamal	328 11.2	N23 28.1
Kaus Aust.	83 55.9	S34 23.1
Kochab	137 19.6	N74 09.3
Markab	13 47.3	N15 12.8
Menkar	314 24.8	N 4 05.8
Menkent	148 18.7	S36 22.7
Miaplacidus	221 42.7	S69 43.3
Mirfak	308 53.8	N49 51.8
Nunki	76 09.5	S26 17.7
Peacock	53 33.2	S56 43.9
Pollux	243 39.4	N28 01.4
Procyon	245 09.7	N 5 13.4
Rasalhague	96 14.9	N12 33.7
Regulus	207 53.7	N11 57.8
Rigel	281 21.1	S 8 11.9
Rigil Kent.	140 04.8	S60 50.6
Sabik	102 23.1	S15 43.5
Schedar	349 50.9	N56 32.5
Shaula	96 34.3	S37 06.3
Sirius	258 42.2	S16 42.9
Spica	158 41.2	S11 10.0
Suhail	222 59.8	S43 26.2
Vega	80 44.9	N38 47.3
Zuben'ubi	137 15.8	S16 02.8

	A.H.S.	Pas. Mer.
	° ′	h m
Venus	253 09.2	9 34
Marte	101 44.1	19 37
Júpiter	262 30.2	8 55
Saturno	287 49.4	7 14

T.U.	SOL				LUNA					
	A.H.G.		Dec.		A.H.G.	v	Dec.	d	P.H.	
d h	°	′	°	′	°	′	′	°	′	′	′
14 00	178	49.1	N14	24.4	252	02.9	8.2	N20	07.4	7.2	58.0
01	193	49.3		23.6	266	30.1	8.1	20	14.6	7.0	58.0
02	208	49.4		22.9	280	57.2	8.1	20	21.6	7.0	58.0
03	223	49.5	. .	22.1	295	24.3	7.9	20	28.6	6.9	58.1
04	238	49.6		21.3	309	51.2	7.8	20	35.5	6.8	58.1
05	253	49.7		20.6	324	18.0	7.7	20	42.3	6.6	58.2
06	268	49.8	N14	19.8	338	44.7	7.6	N20	48.9	6.5	58.2
07	283	50.0		19.0	353	11.3	7.5	20	55.4	6.5	58.2
M 08	298	50.1		18.3	7	37.8	7.4	21	01.9	6.3	58.3
09	313	50.2	. .	17.5	22	04.2	7.3	21	08.2	6.1	58.3
A 10	328	50.3		16.7	36	30.5	7.1	21	14.3	6.1	58.4
R 11	343	50.4		15.9	50	56.6	7.1	21	20.4	5.9	58.4
T 12	358	50.5	N14	15.2	65	22.7	7.0	N21	26.3	5.8	58.4
13	13	50.7		14.4	79	48.7	6.9	21	32.1	5.7	58.5
E 14	28	50.8		13.6	94	14.6	6.8	21	37.8	5.6	58.5
15	43	50.9	. .	12.8	108	40.4	6.7	21	43.4	5.4	58.6
S 16	58	51.0		12.1	123	06.1	6.6	21	48.8	5.3	58.6
17	73	51.1		11.3	137	31.7	6.5	21	54.1	5.2	58.6
18	88	51.3	N14	10.5	151	57.2	6.4	N21	59.3	5.1	58.7
19	103	51.4		09.7	166	22.6	6.3	22	04.4	4.9	58.7
20	118	51.5		09.0	180	47.9	6.2	22	09.3	4.8	58.8
21	133	51.6	. .	08.2	195	13.1	6.1	22	14.1	4.6	58.8
22	148	51.7		07.4	209	38.2	6.0	22	18.7	4.5	58.8
23	163	51.9		06.6	224	03.2	6.0	22	23.2	4.4	58.9
15 00	178	52.0	N14	05.8	238	28.2	5.8	N22	27.6	4.2	58.9
01	193	52.1		05.1	252	53.0	5.7	22	31.8	4.1	59.0
02	208	52.2		04.3	267	17.7	5.7	22	35.9	4.0	59.0
03	223	52.3	. .	03.5	281	42.4	5.6	22	39.9	3.8	59.0
04	238	52.5		02.7	296	07.0	5.5	22	43.7	3.6	59.1
05	253	52.6		01.9	310	31.5	5.3	22	47.3	3.5	59.1
06	268	52.7	N14	01.2	324	55.8	5.4	N22	50.8	3.4	59.2
M 07	283	52.8	14	00.4	339	20.2	5.2	22	54.2	3.2	59.2
I 08	298	53.0	13	59.6	353	44.4	5.1	22	57.4	3.1	59.2
09	313	53.1	. .	58.8	8	08.5	5.1	23	00.5	2.9	59.3
E 10	328	53.2		58.0	22	32.6	5.0	23	03.4	2.8	59.3
R 11	343	53.3		57.2	36	56.6	4.9	23	06.2	2.6	59.3
C 12	358	53.4	N13	56.5	51	20.5	4.8	N23	08.8	2.5	59.4
O 13	13	53.6		55.7	65	44.3	4.8	23	11.3	2.3	59.4
L 14	28	53.7		54.9	80	08.1	4.7	23	13.6	2.2	59.5
E 15	43	53.8	. .	54.1	94	31.8	4.6	23	15.8	2.0	59.5
S 16	58	53.9		53.3	108	55.4	4.5	23	17.8	1.8	59.5
17	73	54.1		52.5	123	18.9	4.5	23	19.6	1.7	59.6
18	88	54.2	N13	51.8	137	42.4	4.4	N23	21.3	1.5	59.6
19	103	54.3		51.0	152	05.8	4.3	23	22.8	1.4	59.6
20	118	54.4		50.2	166	29.1	4.3	23	24.2	1.2	59.7
21	133	54.6	. .	49.4	180	52.4	4.2	23	25.4	1.0	59.7
22	148	54.7		48.6	195	15.6	4.2	23	26.4	0.9	59.8
23	163	54.8		47.8	209	38.8	4.1	23	27.3	0.7	59.8
16 00	178	54.9	N13	47.0	224	01.9	4.0	N23	28.0	0.6	59.8
01	193	55.1		46.2	238	24.9	4.0	23	28.6	0.3	59.9
02	208	55.2		45.5	252	47.9	4.0	23	28.9	0.3	59.9
03	223	55.3	. .	44.7	267	10.9	3.8	23	29.2	0.0	59.9
04	238	55.4		43.9	281	33.7	3.9	23	29.2	0.1	60.0
05	253	55.6		43.1	295	56.6	3.8	23	29.1	0.3	60.0
06	268	55.7	N13	42.3	310	19.4	3.7	N23	28.8	0.4	60.0
07	283	55.8		41.5	324	42.1	3.7	23	28.4	0.6	60.1
J 08	298	56.0		40.7	339	04.8	3.7	23	27.8	0.8	60.1
U 09	313	56.1	. .	39.9	353	27.5	3.6	23	27.0	1.0	60.1
E 10	328	56.2		39.1	7	50.1	3.6	23	26.0	1.1	60.2
11	343	56.3		38.3	22	12.7	3.6	23	24.9	1.3	60.2
V 12	358	56.5	N13	37.5	36	35.3	3.5	N23	23.6	1.5	60.2
13	13	56.6		36.8	50	57.8	3.5	23	22.1	1.6	60.3
E 14	28	56.7		36.0	65	20.3	3.5	23	20.5	1.8	60.3
15	43	56.9	. .	35.2	79	42.8	3.4	23	18.7	2.0	60.3
S 16	58	57.0		34.4	94	05.2	3.4	23	16.7	2.2	60.4
17	73	57.1		33.6	108	27.6	3.4	23	14.5	2.3	60.4
18	88	57.3	N13	32.8	122	50.0	3.4	N23	12.2	2.5	60.4
19	103	57.4		32.0	137	12.4	3.4	23	09.7	2.7	60.5
20	118	57.5		31.2	151	34.8	3.3	23	07.0	2.8	60.5
21	133	57.6	. .	30.4	165	57.1	3.4	23	04.2	3.0	60.5
22	148	57.8		29.6	180	19.5	3.3	23	01.2	3.2	60.5
23	163	57.9		28.8	194	41.8	3.3	N22	58.0	3.4	60.6
	SD	15.8	d	0.8	SD		15.9		16.2		16.4

Lat.	Crepúsculo Náutico	Crepúsculo Civil	Orto Sol	Orto Luna 14	Orto Luna 15	Orto Luna 16	Orto Luna 17
°	h m	h m	h m	h m	h m	h m	h m
N 72	////	////	02 24	▭	▭	▭	▭
N 70	////	////	02 56	▭	▭	▭	▭
68	////	01 43	03 19	19 55	▭	▭	▭
66	////	02 21	03 37	21 37	21 59	23 20	25 21
64	////	02 47	03 52	22 15	22 53	24 07	00 07
62	01 32	03 07	04 04	22 42	23 26	24 38	00 38
60	02 06	03 23	04 14	23 04	23 51	25 01	01 01
N 58	02 30	03 36	04 23	23 21	24 10	00 10	01 19
56	02 49	03 47	04 31	23 36	24 26	00 26	01 35
54	03 04	03 57	04 38	23 48	24 40	00 40	01 48
52	03 17	04 06	04 44	24 00	00 00	00 52	02 00
50	03 28	04 13	04 50	24 10	00 10	01 03	02 10
45	03 50	04 30	05 02	24 30	00 30	01 25	02 32
N 40	04 07	04 42	05 11	00 01	00 47	01 44	02 50
35	04 21	04 53	05 20	00 13	01 02	01 59	03 04
30	04 32	05 02	05 27	00 24	01 14	02 12	03 17
20	04 50	05 17	05 40	00 43	01 36	02 35	03 39
N 10	05 04	05 29	05 51	01 00	01 54	02 54	03 58
0	05 15	05 40	06 01	01 15	02 12	03 13	04 15
S 10	05 25	05 49	06 11	01 31	02 30	03 31	04 33
20	05 33	05 59	06 22	01 47	02 48	03 51	04 52
30	05 41	06 09	06 34	02 07	03 10	04 13	05 13
35	05 45	06 14	06 40	02 18	03 23	04 27	05 26
40	05 48	06 20	06 48	02 31	03 38	04 42	05 41
45	05 52	06 27	06 57	02 46	03 55	05 00	05 58
S 50	05 56	06 34	07 08	03 05	04 17	05 23	06 19
52	05 58	06 38	07 13	03 14	04 28	05 34	06 29
54	06 00	06 41	07 19	03 25	04 40	05 47	06 41
56	06 01	06 45	07 25	03 36	04 53	06 01	06 54
58	06 03	06 50	07 32	03 49	05 09	06 17	07 09
S 60	06 05	06 55	07 39	04 05	05 28	06 38	07 27

Lat.	Ocaso Sol	Crepúsculo Civil	Crepúsculo Náutico	Ocaso Luna 14	Ocaso Luna 15	Ocaso Luna 16	Ocaso Luna 17
°	h m	h m	h m	h m	h m	h m	h m
N 72	21 39	////	////	▭	▭	▭	▭
N 70	21 08	23 30	////	▭	▭	▭	▭
68	20 46	22 19	////	19 51	▭	▭	21 39
66	20 29	21 43	////	18 10	19 53	20 42	20 53
64	20 15	21 19	23 35	17 31	18 58	19 54	20 22
62	20 03	21 00	22 31	17 05	18 25	19 24	19 59
60	19 53	20 44	21 59	16 44	18 01	19 00	19 40
N 58	19 44	20 31	21 36	16 27	17 41	18 41	19 25
56	19 37	20 20	21 18	16 12	17 25	18 26	19 11
54	19 30	20 10	21 03	16 00	17 11	18 12	19 00
52	19 24	20 02	20 50	15 49	16 59	18 00	18 49
50	19 18	19 54	20 40	15 39	16 49	17 50	18 40
45	19 06	19 38	20 18	15 19	16 26	17 28	18 21
N 40	18 57	19 26	20 01	15 03	16 08	17 10	18 05
35	18 48	19 15	19 47	14 49	15 53	16 55	17 51
30	18 41	19 06	19 36	14 37	15 40	16 42	17 40
20	18 29	18 52	19 18	14 16	15 18	16 20	17 19
N 10	18 18	18 40	19 05	13 58	14 59	16 00	17 02
0	18 08	18 29	18 54	13 42	14 40	15 42	16 45
S 10	17 58	18 19	18 44	13 25	14 22	15 24	16 28
20	17 47	18 10	18 36	13 07	14 03	15 04	16 10
30	17 36	18 00	18 28	12 47	13 41	14 42	15 50
35	17 29	17 55	18 25	12 35	13 27	14 29	15 37
40	17 21	17 49	18 21	12 21	13 12	14 13	15 23
45	17 12	17 43	18 17	12 05	12 54	13 55	15 07
S 50	17 01	17 35	18 13	11 45	12 32	13 32	14 46
52	16 57	17 32	18 12	11 36	12 21	13 21	14 36
54	16 51	17 28	18 10	11 26	12 09	13 09	14 25
56	16 45	17 24	18 08	11 14	11 56	12 55	14 12
58	16 38	17 20	18 07	11 00	11 40	12 38	13 57
S 60	16 31	17 15	18 05	10 44	11 20	12 18	13 40

Día	SOL E.T. (−) 00h	SOL E.T. (−) 12h	SOL Pas. Mer.	LUNA Pas. Mer. Sup.	LUNA Pas. Mer. Inf.	LUNA Edad	LUNA Fase
d	m s	m s	h m	h m	h m	d	%
14	04 44	04 38	12 05	07 28	19 57	25	28
15	04 32	04 26	12 04	08 26	20 56	26	18
16	04 20	04 14	12 04	09 27	21 59	27	10

T.U.	ARIES	VENUS −4.0		MARTE −1.1		JUPITER −2.0		SATURNO +0.1	
	A.H.G.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
17 00	325 26.3	216 04.5	N21 24.2	66 26.2	S26 59.7	227 31.7	N23 00.4	253 06.7	N20 41.5
01	340 28.8	231 03.9	24.0	81 27.7	59.8	242 33.7	00.4	268 08.9	41.6
02	355 31.2	246 03.2	23.7	96 29.2	59.8	257 35.6	00.4	283 11.2	41.6
03	10 33.7	261 02.5 . .	23.5	111 30.7 . .	59.8	272 37.6 . .	00.4	298 13.5 . .	41.6
04	25 36.2	276 01.8	23.2	126 32.2	59.8	287 39.5	00.4	313 15.8	41.6
05	40 38.6	291 01.1	23.0	141 33.7	59.8	302 41.5	00.3	328 18.1	41.6
06	55 41.1	306 00.5	N21 22.7	156 35.2	S26 59.8	317 43.4	N23 00.3	343 20.3	N20 41.6
07	70 43.5	320 59.8	22.5	171 36.7	59.8	332 45.4	00.3	358 22.6	41.7
V 08	85 46.0	335 59.1	22.2	186 38.3	59.9	347 47.3	00.3	13 24.9	41.7
I 09	100 48.5	350 58.4 . .	21.9	201 39.8 . .	59.9	2 49.3 . .	00.2	28 27.2 . .	41.7
E 10	115 50.9	5 57.7	21.7	216 41.3	59.9	17 51.2	00.2	43 29.5	41.7
R 11	130 53.4	20 57.1	21.4	231 42.8	59.9	32 53.2	00.2	58 31.7	41.7
N 12	145 55.9	35 56.4	N21 21.2	246 44.3	S26 59.9	47 55.1	N23 00.2	73 34.0	N20 41.7
E 13	160 58.3	50 55.7	20.9	261 45.8	26 59.9	62 57.1	00.1	88 36.3	41.8
S 14	176 00.8	65 55.0	20.6	276 47.3	27 00.0	77 59.0	00.1	103 38.6	41.8
15	191 03.3	80 54.3 . .	20.4	291 48.8 . .	00.0	93 01.0 . .	00.1	118 40.9 . .	41.8
16	206 05.7	95 53.7	20.1	306 50.3	00.0	108 02.9	00.1	133 43.2	41.8
17	221 08.2	110 53.0	19.8	321 51.8	00.0	123 04.9	00.1	148 45.4	41.8
18	236 10.7	125 52.3	N21 19.6	336 53.3	S27 00.0	138 06.9	N23 00.0	163 47.7	N20 41.8
19	251 13.1	140 51.6	19.3	351 54.8	00.0	153 08.8	00.0	178 50.0	41.9
20	266 15.6	155 50.9	19.0	6 56.3	00.1	168 10.8	00.0	193 52.3	41.9
21	281 18.0	170 50.3 . .	18.8	21 57.8 . .	00.1	183 12.7	23 00.0	208 54.6 . .	41.9
22	296 20.5	185 49.6	18.5	36 59.2	00.1	198 14.7	22 59.9	223 56.9	41.9
23	311 23.0	200 48.9	18.2	52 00.7	00.1	213 16.6	59.9	238 59.1	41.9
18 00	326 25.4	215 48.2	N21 18.0	67 02.2	S27 00.1	228 18.6	N22 59.9	254 01.4	N20 41.9
01	341 27.9	230 47.5	17.7	82 03.7	00.1	243 20.5	59.9	269 03.7	42.0
02	356 30.4	245 46.9	17.4	97 05.2	00.1	258 22.5	59.8	284 06.0	42.0
03	11 32.8	260 46.2 . .	17.1	112 06.7 . .	00.2	273 24.4 . .	59.8	299 08.3 . .	42.0
04	26 35.3	275 45.5	16.9	127 08.2	00.2	288 26.4	59.8	314 10.6	42.0
05	41 37.8	290 44.8	16.6	142 09.7	00.2	303 28.4	59.8	329 12.8	42.0
06	56 40.2	305 44.1	N21 16.3	157 11.1	S27 00.2	318 30.3	N22 59.8	344 15.1	N20 42.0
S 07	71 42.7	320 43.5	16.0	172 12.6	00.2	333 32.3	59.7	359 17.4	42.0
08	86 45.1	335 42.8	15.7	187 14.1	00.2	348 34.2	59.7	14 19.7	42.1
A 09	101 47.6	350 42.1 . .	15.5	202 15.6 . .	00.2	3 36.2 . .	59.7	29 22.0 . .	42.1
10	116 50.1	5 41.4	15.2	217 17.1	00.3	18 38.1	59.7	44 24.3	42.1
B 11	131 52.5	20 40.8	14.9	232 18.5	00.3	33 40.1	59.6	59 26.6	42.1
A 12	146 55.0	35 40.1	N21 14.6	247 20.0	S27 00.3	48 42.0	N22 59.6	74 28.8	N20 42.1
13	161 57.5	50 39.4	14.3	262 21.5	00.3	63 44.0	59.6	89 31.1	42.1
D 14	176 59.9	65 38.7	14.0	277 23.0	00.3	78 46.0	59.6	104 33.4	42.2
15	192 02.4	80 38.0 . .	13.7	292 24.4 . .	00.3	93 47.9 . .	59.5	119 35.7 . .	42.2
O 16	207 04.9	95 37.4	13.4	307 25.9	00.3	108 49.9	59.5	134 38.0	42.2
17	222 07.3	110 36.7	13.2	322 27.4	00.4	123 51.8	59.5	149 40.3	42.2
18	237 09.8	125 36.0	N21 12.9	337 28.9	S27 00.4	138 53.8	N22 59.5	164 42.6	N20 42.2
19	252 12.3	140 35.3	12.6	352 30.3	00.4	153 55.7	59.5	179 44.8	42.2
20	267 14.7	155 34.6	12.3	7 31.8	00.4	168 57.7	59.4	194 47.1	42.3
21	282 17.2	170 34.0 . .	12.0	22 33.3 . .	00.4	183 59.7 . .	59.4	209 49.4 . .	42.3
22	297 19.6	185 33.3	11.7	37 34.7	00.4	199 01.6	59.4	224 51.7	42.3
23	312 22.1	200 32.6	11.4	52 36.2	00.4	214 03.6	59.4	239 54.0	42.3
19 00	327 24.6	215 31.9	N21 11.1	67 37.6	S27 00.5	229 05.5	N22 59.3	254 56.3	N20 42.3
01	342 27.0	230 31.3	10.8	82 39.1	00.5	244 07.5	59.3	269 58.6	42.3
02	357 29.5	245 30.6	10.5	97 40.6	00.5	259 09.5	59.3	285 00.9	42.3
03	12 32.0	260 29.9 . .	10.2	112 42.0 . .	00.5	274 11.4 . .	59.3	300 03.1 . .	42.4
04	27 34.4	275 29.2	09.9	127 43.5	00.5	289 13.4	59.2	315 05.4	42.4
05	42 36.9	290 28.5	09.6	142 45.0	00.5	304 15.3	59.2	330 07.7	42.4
06	57 39.4	305 27.9	N21 09.3	157 46.4	S27 00.5	319 17.3	N22 59.2	345 10.0	N20 42.4
07	72 41.8	320 27.2	09.0	172 47.9	00.6	334 19.3	59.2	0 12.3	42.4
D 08	87 44.3	335 26.5	08.7	187 49.3	00.6	349 21.2	59.1	15 14.6	42.4
O 09	102 46.8	350 25.8 . .	08.4	202 50.8 . .	00.6	4 23.2 . .	59.1	30 16.9 . .	42.5
M 10	117 49.2	5 25.1	08.1	217 52.2	00.6	19 25.1	59.1	45 19.2	42.5
I 11	132 51.7	20 24.5	07.8	232 53.7	00.6	34 27.1	59.1	60 21.5	42.5
N 12	147 54.1	35 23.8	N21 07.4	247 55.1	S27 00.6	49 29.1	N22 59.0	75 23.7	N20 42.5
G 13	162 56.6	50 23.1	07.1	262 56.6	00.6	64 31.0	59.0	90 26.0	42.5
O 14	177 59.1	65 22.4	06.8	277 58.0	00.6	79 33.0	59.0	105 28.3	42.5
15	193 01.5	80 21.8 . .	06.5	292 59.5 . .	00.7	94 34.9 . .	59.0	120 30.6 . .	42.5
16	208 04.0	95 21.1	06.2	308 00.9	00.7	109 36.9	59.0	135 32.9	42.6
17	223 06.5	110 20.4	05.9	323 02.4	00.7	124 38.9	58.9	150 35.2	42.6
18	238 08.9	125 19.7	N21 05.6	338 03.8	S27 00.7	139 40.8	N22 58.9	165 37.5	N20 42.6
19	253 11.4	140 19.1	05.2	353 05.3	00.7	154 42.8	58.9	180 39.8	42.6
20	268 13.9	155 18.4	04.9	8 06.7	00.7	169 44.7	58.9	195 42.1	42.6
21	283 16.3	170 17.7 . .	04.6	23 08.1 . .	00.7	184 46.7 . .	58.8	210 44.4 . .	42.6
22	298 18.8	185 17.0	04.3	38 09.6	00.7	199 48.7	58.8	225 46.6	42.6
23	313 21.2	200 16.3	04.0	53 11.0	00.8	214 50.6	58.8	240 48.9	42.7
	h m								
Pas. Mer.	2 13.9	v −0.7	d 0.3	v 1.5	d 0.0	v 2.0	d 0.0	v 2.3	d 0.0

ESTRELLAS		
Nombre	A.H.S.	Dec.
	° ′	° ′
Acamar	315 25.3	S40 17.7
Achernar	335 33.3	S57 13.5
Acrux	173 20.4	S63 06.5
Adhara	255 20.1	S28 58.2
Aldebaran	291 00.1	N16 30.7
Alioth	166 29.1	N55 57.4
Alkaid	153 06.3	N49 18.7
Al Na'ir	27 54.8	S46 57.2
Alnilam	275 56.0	S 1 12.0
Alphard	218 05.5	S 8 39.8
Alphecca	126 18.8	N26 42.9
Alpheratz	357 52.9	N29 05.9
Altair	62 17.0	N 8 52.5
Ankaa	353 24.5	S42 17.7
Antares	112 37.6	S26 26.1
Arcturus	146 04.3	N19 10.7
Atria	107 47.6	S69 02.0
Avior	234 22.5	S59 30.7
Bellatrix	278 42.1	N 6 21.1
Betelgeuse	271 11.5	N 7 24.5
Canopus	264 00.6	S52 41.5
Capella	280 48.4	N45 59.8
Deneb	49 37.4	N45 17.2
Denebola	182 43.4	N14 34.0
Diphda	349 04.9	S17 58.6
Dubhe	194 03.5	N61 44.8
Elnath	278 24.5	N28 36.5
Eltanin	90 50.2	N51 29.6
Enif	33 55.9	N 9 53.0
Fomalhaut	15 33.8	S29 36.8
Gacrux	172 11.8	S57 07.4
Gienah	176 02.1	S17 32.9
Hadar	149 01.5	S60 23.0
Hamal	328 11.2	N23 28.1
Kaus Aust.	83 55.9	S34 23.1
Kochab	137 19.7	N74 09.3
Markab	13 47.3	N15 12.8
Menkar	314 24.7	N 4 05.8
Menkent	148 18.7	S36 22.7
Miaplacidus	221 42.7	S69 43.3
Mirfak	308 53.7	N49 51.8
Nunki	76 09.5	S26 17.7
Peacock	53 33.2	S56 43.9
Pollux	243 39.4	N28 01.4
Procyon	245 09.7	N 5 13.4
Rasalhague	96 14.9	N12 33.7
Regulus	207 53.7	N11 57.8
Rigel	281 21.1	S 8 11.9
Rigil Kent	140 04.8	S60 50.6
Sabik	102 23.1	S15 43.6
Schedar	349 50.9	N56 32.5
Shaula	96 34.3	S37 06.4
Sirius	258 42.2	S16 42.9
Spica	158 41.2	S11 10.0
Suhail	222 59.8	S43 26.2
Vega	80 45.0	N38 47.3
Zuben'ubi	137 15.8	S16 02.8

	A.H.S.	Pas. Mer.
	° ′	h m
Venus	249 22.8	9 37
Marte	100 36.8	19 30
Júpiter	261 53.1	8 46
Saturno	287 36.0	7 03

T.U.	SOL				LUNA						
	A.H.G.		Dec.		A.H.G.	v	Dec.		d	P.H.	
d h	°	′	°	′	°	′	′	°	′	′	′
17 00	178	58.0	N13	28.0	209	04.1	3.3	N22	54.6	3.5	60.6
01	193	58.2		27.2	223	26.4	3.4	22	51.1	3.7	60.6
02	208	58.3		26.4	237	48.8	3.3	22	47.4	3.9	60.7
03	223	58.4	. .	25.6	252	11.1	3.3	22	43.5	4.0	60.7
04	238	58.6		24.8	266	33.4	3.3	22	39.5	4.2	60.7
05	253	58.7		24.0	280	55.7	3.3	22	35.3	4.4	60.7
06	268	58.8	N13	23.2	295	18.0	3.4	N22	30.9	4.6	60.8
V 07	283	59.0		22.4	309	40.4	3.3	22	26.3	4.7	60.8
08	298	59.1		21.6	324	02.7	3.3	22	21.6	4.9	60.8
I 09	313	59.2	. .	20.8	338	25.0	3.4	22	16.7	5.1	60.8
E 10	328	59.4		20.0	352	47.4	3.4	22	11.6	5.2	60.9
R 11	343	59.5		19.2	7	09.8	3.4	22	06.4	5.4	60.9
12	358	59.6	N13	18.4	21	32.2	3.4	N22	01.0	5.6	60.9
N 13	13	59.8		17.6	35	54.6	3.4	21	55.4	5.7	60.9
E 14	28	59.9		16.8	50	17.0	3.5	21	49.7	5.9	60.9
S 15	44	00.0	. .	16.0	64	39.5	3.5	21	43.8	6.1	61.0
16	59	00.2		15.2	79	02.0	3.5	21	37.7	6.2	61.0
17	74	00.3		14.4	93	24.5	3.6	21	31.5	6.4	61.0
18	89	00.4	N13	13.6	107	47.1	3.5	N21	25.1	6.5	61.0
19	104	00.6		12.8	122	09.6	3.6	21	18.6	6.7	61.0
20	119	00.7		12.0	136	32.2	3.7	21	11.9	6.9	61.1
21	134	00.8	. .	11.2	150	54.9	3.7	21	05.0	7.0	61.1
22	149	01.0		10.4	165	17.6	3.7	20	58.0	7.2	61.1
23	164	01.1		09.6	179	40.3	3.8	20	50.8	7.4	61.1
18 00	179	01.3	N13	08.8	194	03.1	3.8	N20	43.4	7.5	61.1
01	194	01.4		08.0	208	25.9	3.8	20	35.9	7.6	61.2
02	209	01.5		07.2	222	48.7	3.9	20	28.3	7.9	61.2
03	224	01.7	. .	06.3	237	11.6	3.9	20	20.4	7.9	61.2
04	239	01.8		05.5	251	34.5	4.0	20	12.5	8.1	61.2
05	254	01.9		04.7	265	57.5	4.0	20	04.4	8.3	61.2
06	269	02.1	N13	03.9	280	20.5	4.1	N19	56.1	8.4	61.2
07	284	02.2		03.1	294	43.6	4.2	19	47.7	8.6	61.2
S 08	299	02.4		02.3	309	06.8	4.2	19	39.1	8.7	61.3
A 09	314	02.5	. .	01.5	323	30.0	4.2	19	30.4	8.9	61.3
B 10	329	02.6	13	00.7	337	53.2	4.3	19	21.5	9.0	61.3
11	344	02.8	12	59.9	352	16.5	4.4	19	12.5	9.1	61.3
A 12	359	02.9	N12	59.1	6	39.9	4.4	N19	03.4	9.3	61.3
D 13	14	03.1		58.3	21	03.3	4.5	18	54.1	9.4	61.3
14	29	03.2		57.4	35	26.8	4.5	18	44.7	9.6	61.3
O 15	44	03.3	. .	56.6	49	50.3	4.6	18	35.1	9.7	61.3
16	59	03.5		55.8	64	13.9	4.7	18	25.4	9.8	61.3
17	74	03.6		55.0	78	37.6	4.7	18	15.6	10.0	61.3
18	89	03.8	N12	54.2	93	01.3	4.8	N18	05.6	10.1	61.4
19	104	03.9		53.4	107	25.1	4.8	17	55.5	10.2	61.4
20	119	04.0		52.6	121	48.9	5.0	17	45.3	10.3	61.4
21	134	04.2	. .	51.8	136	12.9	4.9	17	35.0	10.5	61.4
22	149	04.3		50.9	150	36.8	5.1	17	24.5	10.6	61.4
23	164	04.5		50.1	165	00.9	5.1	17	13.9	10.8	61.4
19 00	179	04.6	N12	49.3	179	25.0	5.2	N17	03.1	10.8	61.4
01	194	04.7		48.5	193	49.2	5.3	16	52.3	11.0	61.4
02	209	04.9		47.7	208	13.5	5.3	16	41.3	11.1	61.4
03	224	05.0	. .	46.9	222	37.8	5.4	16	30.2	11.2	61.4
04	239	05.2		46.1	237	02.2	5.5	16	19.0	11.3	61.4
05	254	05.3		45.2	251	26.7	5.6	16	07.7	11.4	61.4
06	269	05.5	N12	44.4	265	51.3	5.6	N15	56.3	11.5	61.4
07	284	05.6		43.6	280	15.9	5.7	15	44.8	11.7	61.4
D 08	299	05.7		42.8	294	40.6	5.8	15	33.1	11.7	61.4
O 09	314	05.9	. .	42.0	309	05.4	5.8	15	21.4	11.9	61.4
M 10	329	06.0		41.2	323	30.2	5.9	15	09.5	12.0	61.4
I 11	344	06.2		40.3	337	55.1	6.0	14	57.5	12.0	61.4
12	359	06.3	N12	39.5	352	20.1	6.1	N14	45.5	12.2	61.4
N 13	14	06.5		38.7	6	45.2	6.2	14	33.3	12.2	61.4
G 14	29	06.6		37.9	21	10.4	6.2	14	21.1	12.4	61.4
O 15	44	06.8	. .	37.1	35	35.6	6.3	14	08.7	12.4	61.4
16	59	06.9		36.2	50	00.9	6.3	13	56.3	12.6	61.4
17	74	07.0		35.4	64	26.2	6.5	13	43.7	12.6	61.4
18	89	07.2	N12	34.6	78	51.7	6.5	N13	31.1	12.7	61.4
19	104	07.3		33.8	93	17.2	6.6	13	18.4	12.8	61.3
20	119	07.5		33.0	107	42.8	6.7	13	05.6	12.9	61.3
21	134	07.6	. .	32.1	122	08.5	6.7	12	52.7	13.0	61.3
22	149	07.8		31.3	136	34.2	6.8	12	39.7	13.0	61.3
23	164	07.9		30.5	151	00.0	6.9	N12	26.7	13.1	61.3
	SD	15.8	d	0.8	SD		16.6		16.7		16.7

Lat.	Crepúsculo Náutico	Crepúsculo Civil	Orto Sol	Orto Luna 17	Orto Luna 18	Orto Luna 19	Orto Luna 20
°	h m	h m	h m	h m	h m	h m	h m
N 72	////	////	02 44	▭	▭	01 41	04 42
N 70	////	01 13	03 12	▭	▭	02 32	05 02
68	////	02 05	03 32	▭	00 35	03 04	05 17
66	////	02 36	03 48	25 21	01 21	03 27	05 29
64	01 04	02 59	04 01	00 07	01 51	03 45	05 39
62	01 51	03 17	04 12	00 38	02 14	04 00	05 48
60	02 19	03 31	04 21	01 01	02 32	04 13	05 55
N 58	02 40	03 44	04 30	01 19	02 47	04 23	06 02
56	02 57	03 54	04 37	01 35	02 59	04 32	06 07
54	03 11	04 03	04 43	01 48	03 11	04 41	06 12
52	03 23	04 11	04 49	02 00	03 20	04 48	06 17
50	03 34	04 18	04 54	02 10	03 29	04 55	06 21
45	03 55	04 34	05 05	02 32	03 48	05 09	06 30
N 40	04 11	04 46	05 14	02 50	04 03	05 20	06 38
35	04 24	04 56	05 22	03 04	04 16	05 30	06 44
30	04 34	05 04	05 29	03 17	04 27	05 38	06 49
20	04 51	05 18	05 41	03 39	04 46	05 53	06 59
N 10	05 04	05 29	05 51	03 58	05 02	06 06	07 07
0	05 15	05 39	06 00	04 15	05 18	06 18	07 15
S 10	05 23	05 48	06 10	04 33	05 33	06 30	07 23
20	05 31	05 57	06 20	04 52	05 49	06 43	07 32
30	05 38	06 06	06 31	05 13	06 08	06 57	07 41
35	05 41	06 11	06 37	05 26	06 19	07 06	07 46
40	05 45	06 16	06 44	05 41	06 32	07 15	07 53
45	05 48	06 22	06 53	05 58	06 46	07 26	08 00
S 50	05 51	06 29	07 02	06 19	07 04	07 40	08 08
52	05 52	06 32	07 07	06 29	07 12	07 46	08 12
54	05 54	06 35	07 12	06 41	07 22	07 53	08 16
56	05 55	06 39	07 18	06 54	07 32	08 00	08 21
58	05 57	06 43	07 24	07 09	07 44	08 09	08 27
S 60	05 58	06 47	07 31	07 27	07 58	08 18	08 32

Lat.	Ocaso Sol	Crepúsculo Civil	Crepúsculo Náutico	Ocaso Luna 17	Ocaso Luna 18	Ocaso Luna 19	Ocaso Luna 20
°	h m	h m	h m	h m	h m	h m	h m
N 72	21 18	////	////	▭	22 44	21 46	21 16
N 70	20 52	22 44	////	▭	21 52	21 24	21 06
68	20 33	21 57	////	21 39	21 18	21 07	20 58
66	20 17	21 27	////	20 53	20 54	20 53	20 51
64	20 04	21 06	22 54	20 22	20 35	20 41	20 45
62	19 54	20 48	22 12	19 59	20 19	20 31	20 40
60	19 45	20 34	21 45	19 40	20 06	20 23	20 35
N 58	19 37	20 22	21 24	19 25	19 54	20 15	20 31
56	19 30	20 12	21 08	19 11	19 44	20 09	20 28
54	19 23	20 03	20 54	19 00	19 35	20 03	20 24
52	19 18	19 55	20 43	18 49	19 27	19 57	20 21
50	19 13	19 48	20 32	18 40	19 20	19 52	20 19
45	19 02	19 33	20 12	18 21	19 05	19 41	20 13
N 40	18 53	19 21	19 56	18 05	18 52	19 33	20 08
35	18 45	19 11	19 43	17 51	18 41	19 25	20 04
30	18 38	19 03	19 33	17 40	18 32	19 18	20 00
20	18 27	18 49	19 16	17 19	18 15	19 06	19 53
N 10	18 16	18 38	19 03	17 02	18 00	18 56	19 47
0	18 07	18 28	18 53	16 45	17 47	18 46	19 41
S 10	17 58	18 19	18 44	16 28	17 33	18 36	19 36
20	17 48	18 11	18 37	16 10	17 18	18 25	19 30
30	17 37	18 02	18 30	15 50	17 01	18 12	19 22
35	17 31	17 57	18 27	15 37	16 51	18 05	19 18
40	17 24	17 52	18 24	15 23	16 39	17 57	19 14
45	17 16	17 46	18 20	15 07	16 25	17 47	19 08
S 50	17 06	17 39	18 17	14 46	16 09	17 35	19 02
52	17 01	17 36	18 16	14 36	16 01	17 30	18 59
54	16 56	17 33	18 15	14 25	15 52	17 24	18 55
56	16 51	17 30	18 13	14 12	15 42	17 17	18 51
58	16 45	17 26	18 12	13 57	15 31	17 09	18 47
S 60	16 38	17 22	18 11	13 40	15 17	17 01	18 43

Día	SOL E.T. (−) 00h	SOL E.T. (−) 12h	SOL Pas. Mer.	LUNA Pas. Sup.	LUNA Mer. Inf.	LUNA Edad	LUNA Fase
d	m s	m s	h m	h m	h m	d	%
17	04 08	04 02	12 04	10 30	23 01	28	4
18	03 55	03 49	12 04	11 32	24 02	29	1
19	03 42	03 35	12 04	12 32	00 02	00	0

T.U.	ARIES	VENUS −4.0		MARTE −1.1		JUPITER −2.0		SATURNO +0.1	
	A.H.G.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
20 00	328 23.7	215 15.7	N21 03.6	68 12.5	S27 00.8	229 52.6	N22 58.8	255 51.2	N20 42.7
01	343 26.2	230 15.0	03.3	83 13.9	00.8	244 54.6	58.7	270 53.5	42.7
02	358 28.6	245 14.3	03.0	98 15.3	00.8	259 56.5	58.7	285 55.8	42.7
03	13 31.1	260 13.6	02.7	113 16.8	00.8	274 58.5	58.7	300 58.1	42.7
04	28 33.6	275 13.0	02.3	128 18.2	00.8	290 00.4	58.7	316 00.4	42.7
05	43 36.0	290 12.3	02.0	143 19.6	00.8	305 02.4	58.6	331 02.7	42.7
06	58 38.5	305 11.6	N21 01.7	158 21.1	S27 00.8	320 04.4	N22 58.6	346 05.0	N20 42.8
07	73 41.0	320 10.9	01.4	173 22.5	00.8	335 06.3	58.6	1 07.3	42.8
08	88 43.4	335 10.3	01.0	188 23.9	00.9	350 08.3	58.6	16 09.6	42.8
L 09	103 45.9	350 09.6	00.7	203 25.3	00.9	5 10.3	58.5	31 11.9	42.8
U 10	118 48.4	5 08.9	00.4	218 26.8	00.9	20 12.2	58.5	46 14.2	42.8
11	133 50.8	20 08.2	21 00.0	233 28.2	00.9	35 14.2	58.5	61 16.4	42.8
N 12	148 53.3	35 07.5	N20 59.7	248 29.6	S27 00.9	50 16.2	N22 58.5	76 18.7	N20 42.9
E 13	163 55.7	50 06.9	59.4	263 31.1	00.9	65 18.1	58.4	91 21.0	42.9
14	178 58.2	65 06.2	59.0	278 32.5	00.9	80 20.1	58.4	106 23.3	42.9
S 15	194 00.7	80 05.5	58.7	293 33.9	00.9	95 22.1	58.4	121 25.6	42.9
16	209 03.1	95 04.8	58.3	308 35.3	00.9	110 24.0	58.4	136 27.9	42.9
17	224 05.6	110 04.2	58.0	323 36.7	01.0	125 26.0	58.3	151 30.2	42.9
18	239 08.1	125 03.5	N20 57.7	338 38.2	S27 01.0	140 27.9	N22 58.3	166 32.5	N20 42.9
19	254 10.5	140 02.8	57.3	353 39.6	01.0	155 29.9	58.3	181 34.8	43.0
20	269 13.0	155 02.1	57.0	8 41.0	01.0	170 31.9	58.3	196 37.1	43.0
21	284 15.5	170 01.5	56.6	23 42.4	01.0	185 33.8	58.2	211 39.4	43.0
22	299 17.9	185 00.8	56.3	38 43.8	01.0	200 35.8	58.2	226 41.7	43.0
23	314 20.4	200 00.1	55.9	53 45.2	01.0	215 37.8	58.2	241 44.0	43.0
21 00	329 22.9	214 59.4	N20 55.6	68 46.6	S27 01.0	230 39.7	N22 58.2	256 46.3	N20 43.0
01	344 25.3	229 58.8	55.2	83 48.1	01.0	245 41.7	58.2	271 48.6	43.0
02	359 27.8	244 58.1	54.9	98 49.5	01.1	260 43.7	58.1	286 50.9	43.1
03	14 30.2	259 57.4	54.5	113 50.9	01.1	275 45.6	58.1	301 53.2	43.1
04	29 32.7	274 56.7	54.2	128 52.3	01.1	290 47.6	58.1	316 55.5	43.1
05	44 35.2	289 56.1	53.8	143 53.7	01.1	305 49.6	58.1	331 57.8	43.1
06	59 37.6	304 55.4	N20 53.5	158 55.1	S27 01.1	320 51.5	N22 58.0	347 00.1	N20 43.1
07	74 40.1	319 54.7	53.1	173 56.5	01.1	335 53.5	58.0	2 02.4	43.1
M 08	89 42.6	334 54.0	52.8	188 57.9	01.1	350 55.5	58.0	17 04.6	43.1
09	104 45.0	349 53.4	52.4	203 59.3	01.1	5 57.5	58.0	32 06.9	43.1
A 10	119 47.5	4 52.7	52.1	219 00.7	01.1	20 59.4	57.9	47 09.2	43.2
R 11	134 50.0	19 52.0	51.7	234 02.1	01.1	36 01.4	57.9	62 11.5	43.2
T 12	149 52.4	34 51.4	N20 51.4	249 03.5	S27 01.1	51 03.4	N22 57.9	77 13.8	N20 43.2
13	164 54.9	49 50.7	51.0	264 04.9	01.2	66 05.3	57.9	92 16.1	43.2
E 14	179 57.3	64 50.0	50.6	279 06.3	01.2	81 07.3	57.8	107 18.4	43.2
15	194 59.8	79 49.3	50.3	294 07.7	01.2	96 09.3	57.8	122 20.7	43.2
S 16	210 02.3	94 48.7	49.9	309 09.1	01.2	111 11.2	57.8	137 23.0	43.2
17	225 04.7	109 48.0	49.5	324 10.5	01.2	126 13.2	57.8	152 25.3	43.3
18	240 07.2	124 47.3	N20 49.2	339 11.9	S27 01.2	141 15.2	N22 57.7	167 27.6	N20 43.3
19	255 09.7	139 46.6	48.8	354 13.3	01.2	156 17.1	57.7	182 29.9	43.3
20	270 12.1	154 46.0	48.4	9 14.7	01.2	171 19.1	57.7	197 32.2	43.3
21	285 14.6	169 45.3	48.1	24 16.1	01.2	186 21.1	57.7	212 34.5	43.3
22	300 17.1	184 44.6	47.7	39 17.5	01.2	201 23.1	57.6	227 36.8	43.3
23	315 19.5	199 43.9	47.3	54 18.9	01.2	216 25.0	57.6	242 39.1	43.3
22 00	330 22.0	214 43.3	N20 47.0	69 20.2	S27 01.3	231 27.0	N22 57.6	257 41.4	N20 43.4
01	345 24.5	229 42.6	46.6	84 21.6	01.3	246 29.0	57.6	272 43.7	43.4
02	0 26.9	244 41.9	46.2	99 23.0	01.3	261 30.9	57.5	287 46.0	43.4
03	15 29.4	259 41.3	45.8	114 24.4	01.3	276 32.9	57.5	302 48.3	43.4
04	30 31.8	274 40.6	45.5	129 25.8	01.3	291 34.9	57.5	317 50.6	43.4
05	45 34.3	289 39.9	45.1	144 27.2	01.3	306 36.8	57.5	332 52.9	43.4
06	60 36.8	304 39.2	N20 44.7	159 28.5	S27 01.3	321 38.8	N22 57.4	347 55.2	N20 43.4
M 07	75 39.2	319 38.6	44.3	174 29.9	01.3	336 40.8	57.4	2 57.5	43.5
I 08	90 41.7	334 37.9	44.0	189 31.3	01.3	351 42.8	57.4	17 59.8	43.5
E 09	105 44.2	349 37.2	43.6	204 32.7	01.3	6 44.7	57.4	33 02.1	43.5
R 10	120 46.6	4 36.6	43.2	219 34.1	01.3	21 46.7	57.3	48 04.4	43.5
C 11	135 49.1	19 35.9	42.8	234 35.4	01.3	36 48.7	57.3	63 06.7	43.5
O 12	150 51.6	34 35.2	N20 42.4	249 36.8	S27 01.3	51 50.7	N22 57.3	78 09.0	N20 43.5
L 13	165 54.0	49 34.5	42.0	264 38.2	01.4	66 52.6	57.3	93 11.3	43.5
E 14	180 56.5	64 33.9	41.7	279 39.6	01.4	81 54.6	57.2	108 13.6	43.5
S 15	195 58.9	79 33.2	41.3	294 40.9	01.4	96 56.6	57.2	123 15.9	43.6
16	211 01.4	94 32.5	40.9	309 42.3	01.4	111 58.5	57.2	138 18.2	43.6
17	226 03.9	109 31.9	40.5	324 43.7	01.4	127 00.5	57.2	153 20.5	43.6
18	241 06.3	124 31.2	N20 40.1	339 45.1	S27 01.4	142 02.5	N22 57.1	168 22.8	N20 43.6
19	256 08.8	139 30.5	39.7	354 46.4	01.4	157 04.5	57.1	183 25.1	43.6
20	271 11.3	154 29.9	39.3	9 47.8	01.4	172 06.4	57.1	198 27.4	43.6
21	286 13.7	169 29.2	38.9	24 49.2	01.4	187 08.4	57.1	213 29.7	43.6
22	301 16.2	184 28.5	38.5	39 50.5	01.4	202 10.4	57.0	228 32.1	43.6
23	316 18.7	199 27.8	38.1	54 51.9	01.4	217 12.4	57.0	243 34.4	43.7
	h m								
Pas. Mer.	2 02.1	*v* −0.7	*d* 0.4	*v* 1.4	*d* 0.0	*v* 2.0	*d* 0.0	*v* 2.3	*d* 0.0

ESTRELLAS		
Nombre	A.H.S.	Dec.
	° ′	° ′
Acamar	315 25.2	S40 17.7
Achernar	335 33.2	S57 13.5
Acrux	173 20.4	S63 06.5
Adhara	255 20.1	S28 58.2
Aldebaran	291 00.1	N16 30.7
Alioth	166 29.1	N55 57.4
Alkaid	153 06.4	N49 18.7
Al Na'ir	27 54.8	S46 57.2
Alnilam	275 55.9	S 1 12.0
Alphard	218 05.5	S 8 39.7
Alphecca	126 18.9	N26 42.9
Alpheratz	357 52.9	N29 05.9
Altair	62 17.0	N 8 52.5
Ankaa	353 24.4	S42 17.7
Antares	112 37.6	S26 26.1
Arcturus	146 04.3	N19 10.7
Atria	107 47.7	S69 02.0
Avior	234 22.5	S59 30.7
Bellatrix	278 42.1	N 6 21.1
Betelgeuse	271 11.5	N 7 24.5
Canopus	264 00.6	S52 41.5
Capella	280 48.4	N45 59.8
Deneb	49 37.4	N45 17.3
Denebola	182 43.4	N14 34.0
Diphda	349 04.9	S17 58.6
Dubhe	194 03.5	N61 44.8
Elnath	278 24.5	N28 36.5
Eltanin	90 50.2	N51 29.6
Enif	33 55.9	N 9 53.0
Fomalhaut	15 33.8	S29 36.8
Gacrux	172 11.9	S57 07.3
Gienah	176 02.2	S17 32.9
Hadar	149 01.5	S60 22.9
Hamal	328 11.1	N23 28.1
Kaus Aust.	83 55.9	S34 23.1
Kochab	137 19.7	N74 09.3
Markab	13 47.3	N15 12.8
Menkar	314 24.7	N 4 05.8
Menkent	148 18.8	S36 22.7
Miaplacidus	221 42.7	S69 43.3
Mirfak	308 53.7	N49 51.8
Nunki	76 09.5	S26 17.7
Peacock	53 33.2	S56 43.9
Pollux	243 39.4	N28 01.4
Procyon	245 09.7	N 5 13.4
Rasalhague	96 14.9	N12 33.7
Regulus	207 53.7	N11 57.8
Rigel	281 21.1	S 8 11.9
Rigil Kent.	140 04.9	S60 50.6
Sabik	102 23.1	S15 43.6
Schedar	349 50.8	N56 32.6
Shaula	96 34.3	S37 06.4
Sirius	258 42.2	S16 42.9
Spica	158 41.2	S11 10.0
Suhail	222 59.8	S43 26.2
Vega	80 45.0	N38 47.3
Zuben'ubi	137 15.8	S16 02.8

	A.H.S.	Pas. Mer.
	° ′	h m
Venus	245 36.6	9 40
Marte	99 23.8	19 23
Júpiter	261 16.9	8 36
Saturno	287 23.4	6 52

T.U.	SOL				LUNA						
	A.H.G.		Dec.		A.H.G.	v		Dec.	d		P.H.
d h	°	′	°	′	°	′	′	°	′	′	′
20 00	179	08.1	N12	29.7	165	25.9	7.0	N12	13.6	13.2	61.3
01	194	08.2		28.8	179	51.9	7.0	12	00.4	13.3	61.3
02	209	08.4		28.0	194	17.9	7.2	11	47.1	13.4	61.3
03	224	08.5	. .	27.2	208	44.1	7.2	11	33.7	13.4	61.3
04	239	08.7		26.4	223	10.3	7.2	11	20.3	13.5	61.2
05	254	08.8		25.5	237	36.5	7.4	11	06.8	13.5	61.2
06	269	09.0	N12	24.7	252	02.9	7.4	N10	53.3	13.6	61.2
07	284	09.1		23.9	266	29.3	7.5	10	39.7	13.7	61.2
L 08	299	09.2		23.1	280	55.8	7.5	10	26.0	13.7	61.2
09	314	09.4	. .	22.2	295	22.3	7.6	10	12.3	13.8	61.2
U 10	329	09.5		21.4	309	48.9	7.7	9	58.5	13.9	61.2
11	344	09.7		20.6	324	15.6	7.8	9	44.6	13.9	61.1
N 12	359	09.8	N12	19.8	338	42.4	7.8	N 9	30.7	13.9	61.1
E 13	14	10.0		18.9	353	09.2	7.9	9	16.8	14.0	61.1
14	29	10.1		18.1	7	36.1	8.0	9	02.8	14.1	61.1
S 15	44	10.3	. .	17.3	22	03.1	8.1	8	48.7	14.1	61.1
16	59	10.4		16.5	36	30.2	8.1	8	34.6	14.1	61.1
17	74	10.6		15.6	50	57.3	8.2	8	20.5	14.2	61.0
18	89	10.7	N12	14.8	65	24.5	8.2	N 8	06.3	14.2	61.0
19	104	10.9		14.0	79	51.7	8.3	7	52.1	14.3	61.0
20	119	11.0		13.1	94	19.0	8.4	7	37.8	14.3	61.0
21	134	11.2	. .	12.3	108	46.4	8.4	7	23.5	14.3	61.0
22	149	11.3		11.5	123	13.8	8.5	7	09.2	14.4	60.9
23	164	11.5		10.6	137	41.3	8.6	6	54.8	14.4	60.9
21 00	179	11.7	N12	09.8	152	08.9	8.6	N 6	40.4	14.5	60.9
01	194	11.8		09.0	166	36.5	8.7	6	25.9	14.4	60.9
02	209	12.0		08.2	181	04.2	8.8	6	11.5	14.5	60.8
03	224	12.1	. .	07.3	195	32.0	8.8	5	57.0	14.5	60.8
04	239	12.3		06.5	209	59.8	8.9	5	42.5	14.5	60.8
05	254	12.4		05.7	224	27.7	8.9	5	28.0	14.6	60.8
06	269	12.6	N12	04.8	238	55.6	9.0	N 5	13.4	14.6	60.7
07	284	12.7		04.0	253	23.6	9.0	4	58.8	14.5	60.7
M 08	299	12.9		03.2	267	51.6	9.1	4	44.3	14.7	60.7
09	314	13.0	. .	02.3	282	19.7	9.2	4	29.6	14.6	60.7
A 10	329	13.2		01.5	296	47.9	9.2	4	15.0	14.6	60.6
R 11	344	13.3	12	00.7	311	16.1	9.3	4	00.4	14.6	60.6
T 12	359	13.5	N11	59.8	325	44.4	9.3	N 3	45.8	14.7	60.6
13	14	13.6		59.0	340	12.7	9.4	3	31.1	14.6	60.6
E 14	29	13.8		58.1	354	41.1	9.4	3	16.5	14.7	60.5
S 15	44	14.0	. .	57.3	9	09.5	9.5	3	01.8	14.6	60.5
16	59	14.1		56.5	23	38.0	9.5	2	47.2	14.7	60.5
17	74	14.3		55.6	38	06.5	9.6	2	32.5	14.7	60.4
18	89	14.4	N11	54.8	52	35.1	9.6	N 2	17.8	14.6	60.4
19	104	14.6		54.0	67	03.7	9.7	2	03.2	14.7	60.4
20	119	14.7		53.1	81	32.4	9.7	1	48.5	14.6	60.3
21	134	14.9	. .	52.3	96	01.1	9.7	1	33.9	14.7	60.3
22	149	15.0		51.5	110	29.8	9.8	1	19.2	14.6	60.3
23	164	15.2		50.6	124	58.6	9.9	1	04.6	14.6	60.3
22 00	179	15.4	N11	49.8	139	27.5	9.9	N 0	50.0	14.6	60.2
01	194	15.5		48.9	153	56.4	9.9	0	35.4	14.6	60.2
02	209	15.7		48.1	168	25.3	10.0	0	20.8	14.6	60.2
03	224	15.8	. .	47.3	182	54.3	10.0	N 0	06.2	14.6	60.1
04	239	16.0		46.4	197	23.3	10.0	S 0	08.4	14.5	60.1
05	254	16.1		45.6	211	52.3	10.1	0	22.9	14.6	60.1
06	269	16.3	N11	44.7	226	21.4	10.2	S 0	37.5	14.5	60.0
M 07	284	16.5		43.9	240	50.6	10.1	0	52.0	14.5	60.0
I 08	299	16.6		43.1	255	19.7	10.2	1	06.5	14.4	60.0
E 09	314	16.8	. .	42.2	269	48.9	10.2	1	20.9	14.5	59.9
R 10	329	16.9		41.4	284	18.1	10.3	1	35.4	14.4	59.9
11	344	17.1		40.5	298	47.4	10.3	1	49.8	14.4	59.9
C 12	359	17.3	N11	39.7	313	16.7	10.3	S 2	04.2	14.3	59.8
O 13	14	17.4		38.8	327	46.0	10.4	2	18.5	14.4	59.8
L 14	29	17.6		38.0	342	15.4	10.4	2	32.9	14.3	59.7
E 15	44	17.7	. .	37.2	356	44.8	10.4	2	47.2	14.2	59.7
S 16	59	17.9		36.3	11	14.2	10.4	3	01.4	14.2	59.7
17	74	18.1		35.5	25	43.6	10.5	3	15.6	14.2	59.6
18	89	18.2	N11	34.6	40	13.1	10.5	S 3	29.8	14.2	59.6
19	104	18.4		33.8	54	42.6	10.5	3	44.0	14.1	59.6
20	119	18.5		32.9	69	12.1	10.6	3	58.1	14.1	59.5
21	134	18.7	. .	32.1	83	41.7	10.5	4	12.2	14.0	59.5
22	149	18.9		31.2	98	11.2	10.6	4	26.2	14.0	59.5
23	164	19.0		30.4	112	40.8	10.6	S 4	40.2	13.9	59.4
	SD	15.8	d	0.8	SD		16.7		16.5		16.3

Lat.	Crepúsculo Náutico	Crepúsculo Civil	Orto Sol	Orto Luna 20	Orto Luna 21	Orto Luna 22	Orto Luna 23
°	h m	h m	h m	h m	h m	h m	h m
N 72	////	////	03 03	04 42	07 07	09 21	11 33
N 70	////	01 45	03 26	05 02	07 14	09 19	11 21
68	////	02 24	03 44	05 17	07 20	09 17	11 11
66	////	02 50	03 58	05 29	07 25	09 16	11 03
64	01 32	03 11	04 10	05 39	07 29	09 14	10 57
62	02 07	03 27	04 20	05 48	07 32	09 13	10 51
60	02 32	03 40	04 29	05 55	07 35	09 12	10 46
N 58	02 51	03 51	04 36	06 02	07 38	09 11	10 42
56	03 06	04 01	04 43	06 07	07 40	09 11	10 38
54	03 19	04 09	04 48	06 12	07 43	09 10	10 34
52	03 30	04 17	04 54	06 17	07 44	09 09	10 31
50	03 40	04 23	04 58	06 21	07 46	09 09	10 28
45	03 59	04 37	05 09	06 30	07 50	09 07	10 22
N 40	04 14	04 49	05 17	06 38	07 53	09 06	10 17
35	04 26	04 58	05 24	06 44	07 56	09 06	10 13
30	04 36	05 06	05 31	06 49	07 58	09 05	10 09
20	04 52	05 19	05 42	06 59	08 02	09 04	10 03
N 10	05 04	05 30	05 51	07 07	08 06	09 02	09 57
0	05 14	05 39	06 00	07 15	08 10	09 01	09 52
S 10	05 22	05 47	06 08	07 23	08 13	09 00	09 47
20	05 29	05 55	06 17	07 32	08 17	08 59	09 41
30	05 35	06 03	06 28	07 41	08 21	08 58	09 35
35	05 38	06 08	06 33	07 46	08 23	08 58	09 31
40	05 41	06 12	06 40	07 53	08 26	08 57	09 27
45	05 43	06 18	06 48	08 00	08 29	08 56	09 23
S 50	05 46	06 24	06 57	08 08	08 33	08 55	09 17
52	05 47	06 26	07 01	08 12	08 35	08 55	09 15
54	05 48	06 29	07 06	08 16	08 36	08 54	09 12
56	05 49	06 32	07 11	08 21	08 38	08 54	09 09
58	05 50	06 35	07 16	08 27	08 41	08 53	09 06
S 60	05 51	06 39	07 23	08 32	08 43	08 53	09 02

Lat.	Ocaso Sol	Crepúsculo Civil	Crepúsculo Náutico	Ocaso Luna 20	Ocaso Luna 21	Ocaso Luna 22	Ocaso Luna 23
°	h m	h m	h m	h m	h m	h m	h m
N 72	20 59	23 32	////	21 16	20 53	20 31	20 07
N 70	20 37	22 14	////	21 06	20 51	20 37	20 22
68	20 19	21 37	////	20 58	20 50	20 42	20 33
66	20 05	21 12	23 36	20 51	20 48	20 46	20 43
64	19 54	20 53	22 28	20 45	20 47	20 49	20 51
62	19 44	20 37	21 55	20 40	20 46	20 52	20 58
60	19 36	20 24	21 31	20 35	20 45	20 55	21 04
N 58	19 29	20 13	21 13	20 31	20 45	20 57	21 10
56	19 22	20 04	20 58	20 28	20 44	20 59	21 15
54	19 17	19 56	20 45	20 24	20 43	21 01	21 19
52	19 11	19 48	20 35	20 21	20 43	21 03	21 23
50	19 07	19 42	20 25	20 19	20 42	21 04	21 27
45	18 57	19 28	20 06	20 13	20 41	21 08	21 35
N 40	18 48	19 17	19 51	20 08	20 40	21 10	21 41
35	18 41	19 08	19 39	20 04	20 39	21 13	21 47
30	18 35	19 00	19 29	20 00	20 38	21 15	21 52
20	18 24	18 47	19 14	19 53	20 37	21 19	22 01
N 10	18 15	18 37	19 02	19 47	20 36	21 22	22 08
0	18 06	18 28	18 52	19 41	20 34	21 25	22 16
S 10	17 58	18 19	18 44	19 36	20 33	21 29	22 23
20	17 49	18 12	18 37	19 30	20 32	21 32	22 31
30	17 39	18 03	18 31	19 22	20 30	21 36	22 39
35	17 33	17 59	18 29	19 18	20 29	21 38	22 45
40	17 27	17 54	18 26	19 14	20 28	21 40	22 50
45	17 19	17 49	18 24	19 08	20 27	21 43	22 57
S 50	17 10	17 43	18 21	19 02	20 26	21 47	23 06
52	17 06	17 41	18 20	18 59	20 25	21 48	23 09
54	17 01	17 38	18 19	18 55	20 24	21 50	23 14
56	16 56	17 35	18 18	18 51	20 23	21 52	23 18
58	16 51	17 32	18 18	18 47	20 22	21 54	23 23
S 60	16 44	17 28	18 17	18 43	20 21	21 57	23 29

Día	SOL E.T. (−) 00h	SOL E.T. (−) 12h	SOL Pas. Mer.	LUNA Pas. Sup.	LUNA Mer. Inf.	LUNA Edad	LUNA Fase
d	m s	m s	h m	h m	h m	d	%
20	03 28	03 21	12 03	13 28	01 01	01	3
21	03 14	03 06	12 03	14 22	01 56	02	9
22	02 59	02 51	12 03	15 13	02 48	03	16

T.U.	ARIES	VENUS −4.0		MARTE −1.0		JUPITER −2.0		SATURNO +0.1	
d h	A.H.G.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.
	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
23 00	331 21.1	214 27.2	N20 37.8	69 53.3	S27 01.4	232 14.3	N22 57.0	258 36.7	N20 43.7
01	346 23.6	229 26.5	37.4	84 54.6	01.4	247 16.3	57.0	273 39.0	43.7
02	1 26.1	244 25.8	37.0	99 56.0	01.4	262 18.3	56.9	288 41.3	43.7
03	16 28.5	259 25.2	. . 36.6	114 57.3	. . 01.4	277 20.3	. . 56.9	303 43.6	. . 43.7
04	31 31.0	274 24.5	36.2	129 58.7	01.4	292 22.2	56.9	318 45.9	43.7
05	46 33.4	289 23.8	35.8	145 00.1	01.4	307 24.2	56.9	333 48.2	43.7
06	61 35.9	304 23.2	N20 35.4	160 01.4	S27 01.5	322 26.2	N22 56.8	348 50.5	N20 43.8
07	76 38.4	319 22.5	35.0	175 02.8	01.5	337 28.2	56.8	3 52.8	43.8
J 08	91 40.8	334 21.8	34.5	190 04.1	01.5	352 30.1	56.8	18 55.1	43.8
U 09	106 43.3	349 21.2	. . 34.1	205 05.5	. . 01.5	7 32.1	. . 56.7	33 57.4	. . 43.8
E 10	121 45.8	4 20.5	33.7	220 06.8	01.5	22 34.1	56.7	48 59.7	43.8
V 11	136 48.2	19 19.8	33.3	235 08.2	01.5	37 36.1	56.7	64 02.0	43.8
12	151 50.7	34 19.1	N20 32.9	250 09.5	S27 01.5	52 38.1	N22 56.7	79 04.3	N20 43.8
E 13	166 53.2	49 18.5	32.5	265 10.9	01.5	67 40.0	56.6	94 06.6	43.8
S 14	181 55.6	64 17.8	32.1	280 12.2	01.5	82 42.0	56.6	109 08.9	43.9
15	196 58.1	79 17.1	. . 31.7	295 13.6	. . 01.5	97 44.0	. . 56.6	124 11.2	. . 43.9
16	212 00.5	94 16.5	31.3	310 14.9	01.5	112 46.0	56.6	139 13.5	43.9
17	227 03.0	109 15.8	30.9	325 16.3	01.5	127 47.9	56.5	154 15.8	43.9
18	242 05.5	124 15.1	N20 30.5	340 17.6	S27 01.5	142 49.9	N22 56.5	169 18.2	N20 43.9
19	257 07.9	139 14.5	30.0	355 19.0	01.5	157 51.9	56.5	184 20.5	43.9
20	272 10.4	154 13.8	29.6	10 20.3	01.5	172 53.9	56.5	199 22.8	43.9
21	287 12.9	169 13.1	. . 29.2	25 21.7	. . 01.5	187 55.9	. . 56.4	214 25.1	. . 43.9
22	302 15.3	184 12.5	28.8	40 23.0	01.5	202 57.8	56.4	229 27.4	44.0
23	317 17.8	199 11.8	28.4	55 24.4	01.5	217 59.8	56.4	244 29.7	44.0
24 00	332 20.3	214 11.1	N20 28.0	70 25.7	S27 01.5	233 01.8	N22 56.4	259 32.0	N20 44.0
01	347 22.7	229 10.5	27.5	85 27.0	01.5	248 03.8	56.3	274 34.3	44.0
02	2 25.2	244 09.8	27.1	100 28.4	01.5	263 05.7	56.3	289 36.6	44.0
03	17 27.7	259 09.1	. . 26.7	115 29.7	. . 01.5	278 07.7	. . 56.3	304 38.9	. . 44.0
04	32 30.1	274 08.5	26.3	130 31.0	01.5	293 09.7	56.3	319 41.2	44.0
05	47 32.6	289 07.8	25.8	145 32.4	01.6	308 11.7	56.2	334 43.5	44.0
06	62 35.0	304 07.1	N20 25.4	160 33.7	S27 01.6	323 13.7	N22 56.2	349 45.8	N20 44.1
07	77 37.5	319 06.5	25.0	175 35.0	01.6	338 15.6	56.2	4 48.2	44.1
V 08	92 40.0	334 05.8	24.6	190 36.4	01.6	353 17.6	56.2	19 50.5	44.1
I 09	107 42.4	349 05.2	. . 24.1	205 37.7	. . 01.6	8 19.6	. . 56.1	34 52.8	. . 44.1
E 10	122 44.9	4 04.5	23.7	220 39.0	01.6	23 21.6	56.1	49 55.1	44.1
R 11	137 47.4	19 03.8	23.3	235 40.4	01.6	38 23.6	56.1	64 57.4	44.1
12	152 49.8	34 03.2	N20 22.8	250 41.7	S27 01.6	53 25.6	N22 56.1	79 59.7	N20 44.1
N 13	167 52.3	49 02.5	22.4	265 43.0	01.6	68 27.5	56.0	95 02.0	44.1
E 14	182 54.8	64 01.8	22.0	280 44.4	01.6	83 29.5	56.0	110 04.3	44.2
S 15	197 57.2	79 01.2	. . 21.5	295 45.7	. . 01.6	98 31.5	. . 56.0	125 06.6	. . 44.2
16	212 59.7	94 00.5	21.1	310 47.0	01.6	113 33.5	56.0	140 08.9	44.2
17	228 02.2	108 59.8	20.7	325 48.3	01.6	128 35.5	55.9	155 11.3	44.2
18	243 04.6	123 59.2	N20 20.2	340 49.7	S27 01.6	143 37.4	N22 55.9	170 13.6	N20 44.2
19	258 07.1	138 58.5	19.8	355 51.0	01.6	158 39.4	55.9	185 15.9	44.2
20	273 09.5	153 57.8	19.4	10 52.3	01.6	173 41.4	55.8	200 18.2	44.2
21	288 12.0	168 57.2	. . 18.9	25 53.6	. . 01.6	188 43.4	. . 55.8	215 20.5	. . 44.2
22	303 14.5	183 56.5	18.5	40 54.9	01.6	203 45.4	55.8	230 22.8	44.2
23	318 16.9	198 55.9	18.0	55 56.3	01.6	218 47.4	55.8	245 25.1	44.3
25 00	333 19.4	213 55.2	N20 17.6	70 57.6	S27 01.6	233 49.3	N22 55.7	260 27.4	N20 44.3
01	348 21.9	228 54.5	17.1	85 58.9	01.6	248 51.3	55.7	275 29.7	44.3
02	3 24.3	243 53.9	16.7	101 00.2	01.6	263 53.3	55.7	290 32.1	44.3
03	18 26.8	258 53.2	. . 16.2	116 01.5	. . 01.6	278 55.3	. . 55.7	305 34.4	. . 44.3
04	33 29.3	273 52.5	15.8	131 02.8	01.6	293 57.3	55.6	320 36.7	44.3
05	48 31.7	288 51.9	15.3	146 04.1	01.6	308 59.3	55.6	335 39.0	44.3
06	63 34.2	303 51.2	N20 14.9	161 05.5	S27 01.6	324 01.2	N22 55.6	350 41.3	N20 44.3
07	78 36.6	318 50.6	14.4	176 06.8	01.6	339 03.2	55.6	5 43.6	44.4
S 08	93 39.1	333 49.9	14.0	191 08.1	01.6	354 05.2	55.5	20 45.9	44.4
A 09	108 41.6	348 49.2	. . 13.5	206 09.4	. . 01.6	9 07.2	. . 55.5	35 48.2	. . 44.4
B 10	123 44.0	3 48.6	13.1	221 10.7	01.6	24 09.2	55.5	50 50.6	44.4
11	138 46.5	18 47.9	12.6	236 12.0	01.6	39 11.2	55.5	65 52.9	44.4
A 12	153 49.0	33 47.3	N20 12.2	251 13.3	S27 01.6	54 13.2	N22 55.4	80 55.2	N20 44.4
D 13	168 51.4	48 46.6	11.7	266 14.6	01.6	69 15.1	55.4	95 57.5	44.4
O 14	183 53.9	63 45.9	11.3	281 15.9	01.6	84 17.1	55.4	110 59.8	44.4
15	198 56.4	78 45.3	. . 10.8	296 17.2	. . 01.6	99 19.1	. . 55.4	126 02.1	. . 44.4
16	213 58.8	93 44.6	10.3	311 18.5	01.6	114 21.1	55.3	141 04.4	44.5
17	229 01.3	108 44.0	09.9	326 19.8	01.6	129 23.1	55.3	156 06.8	44.5
18	244 03.8	123 43.3	N20 09.4	341 21.1	S27 01.6	144 25.1	N22 55.3	171 09.1	N20 44.5
19	259 06.2	138 42.6	09.0	356 22.4	01.6	159 27.1	55.2	186 11.4	44.5
20	274 08.7	153 42.0	08.5	11 23.7	01.6	174 29.0	55.2	201 13.7	44.5
21	289 11.1	168 41.3	. . 08.0	26 25.0	. . 01.6	189 31.0	. . 55.2	216 16.0	. . 44.5
22	304 13.6	183 40.7	07.6	41 26.3	01.6	204 33.0	55.2	231 18.3	44.5
23	319 16.1	198 40.0	07.1	56 27.6	01.6	219 35.0	55.1	246 20.6	44.5
	h m								
Pas. Mer.	1 50.3	v −0.7	d 0.4	v 1.3	d 0.0	v 2.0	d 0.0	v 2.3	d 0.0

ESTRELLAS

Nombre	A.H.S.	Dec.
	° ′	° ′
Acamar	315 25.2	S40 17.7
Achernar	335 33.2	S57 13.5
Acrux	173 20.4	S63 06.5
Adhara	255 20.1	S28 58.2
Aldebaran	291 00.1	N16 30.7
Alioth	166 29.1	N55 57.4
Alkaid	153 06.4	N49 18.7
Al Na'ir	27 54.8	S46 57.2
Alnilam	275 55.9	S 1 11.9
Alphard	218 05.5	S 8 39.7
Alphecca	126 18.9	N26 42.9
Alpheratz	357 52.8	N29 05.9
Altair	62 17.0	N 8 52.5
Ankaa	353 24.4	S42 17.7
Antares	112 37.6	S26 26.1
Arcturus	146 04.3	N19 10.7
Atria	107 47.7	S69 02.0
Avior	234 22.5	S59 30.7
Bellatrix	278 42.1	N 6 21.1
Betelgeuse	271 11.5	N 7 24.5
Canopus	264 00.6	S52 41.5
Capella	280 48.3	N45 59.8
Deneb	49 37.4	N45 17.3
Denebola	182 43.4	N14 34.0
Diphda	349 04.9	S17 58.6
Dubhe	194 03.5	N61 44.8
Elnath	278 24.5	N28 36.5
Eltanin	90 50.2	N51 29.6
Enif	33 55.9	N 9 53.0
Fomalhaut	15 33.8	S29 36.8
Gacrux	172 11.9	S57 07.3
Gienah	176 02.2	S17 32.9
Hadar	149 01.5	S60 22.9
Hamal	328 11.1	N23 28.1
Kaus Aust.	83 55.9	S34 23.1
Kochab	137 19.8	N74 09.3
Markab	13 47.3	N15 12.8
Menkar	314 24.7	N 4 05.8
Menkent	148 18.8	S36 22.7
Miaplacidus	221 42.7	S69 43.3
Mirfak	308 53.7	N49 51.8
Nunki	76 09.5	S26 17.7
Peacock	53 33.2	S56 43.9
Pollux	243 39.4	N28 01.4
Procyon	245 09.7	N 5 13.4
Rasalhague	96 14.9	N12 33.7
Regulus	207 53.7	N11 57.8
Rigel	281 21.1	S 8 11.9
Rigil Kent.	140 04.9	S60 50.6
Sabik	102 23.1	S15 43.6
Schedar	349 50.8	N56 32.6
Shaula	96 34.4	S37 06.4
Sirius	258 42.1	S16 42.9
Spica	158 41.3	S11 10.0
Suhail	222 59.8	S43 26.1
Vega	80 45.0	N38 47.3
Zuben'ubi	137 15.8	S16 02.8

	A.H.S.	Pas. Mer.
	° ′	h m
Venus	241 50.9	9 44
Marte	98 05.4	19 17
Júpiter	260 41.5	8 27
Saturno	287 11.7	6 41

T.U.	SOL				LUNA						
	A.H.G.		Dec.		A.H.G.	v		Dec.	d	P.H.	
d h	°	′	°	′	°	′	′	°	′	′	′
23 00	179	19.2	N11	29.5	127	10.4	10.7	S 4	54.1	14.0	59.4
01	194	19.3		28.7	141	40.1	10.6	5	08.1	13.8	59.3
02	209	19.5		27.9	156	09.7	10.7	5	21.9	13.8	59.3
03	224	19.7	. .	27.0	170	39.4	10.7	5	35.7	13.8	59.3
04	239	19.8		26.2	185	09.1	10.7	5	49.5	13.7	59.2
05	254	20.0		25.3	199	38.8	10.7	6	03.2	13.6	59.2
06	269	20.2	N11	24.5	214	08.5	10.8	S 6	16.8	13.6	59.2
07	284	20.3		23.6	228	38.3	10.7	6	30.4	13.6	59.1
J 08	299	20.5		22.8	243	08.0	10.8	6	44.0	13.5	59.1
U 09	314	20.6	. .	21.9	257	37.8	10.8	6	57.5	13.4	59.0
10	329	20.8		21.1	272	07.6	10.8	7	10.9	13.4	59.0
E 11	344	21.0		20.2	286	37.4	10.8	7	24.3	13.4	59.0
V 12	359	21.1	N11	19.4	301	07.2	10.8	S 7	37.7	13.2	58.9
13	14	21.3		18.5	315	37.0	10.8	7	50.9	13.2	58.9
E 14	29	21.5		17.7	330	06.8	10.9	8	04.1	13.2	58.8
15	44	21.6	. .	16.8	344	36.7	10.8	8	17.3	13.1	58.8
S 16	59	21.8		16.0	359	06.5	10.9	8	30.4	13.0	58.8
17	74	22.0		15.1	13	36.4	10.8	8	43.4	13.0	58.7
18	89	22.1	N11	14.3	28	06.2	10.9	S 8	56.4	12.9	58.7
19	104	22.3		13.4	42	36.1	10.9	9	09.3	12.8	58.7
20	119	22.5		12.5	57	06.0	10.9	9	22.1	12.7	58.6
21	134	22.6	. .	11.7	71	35.9	10.9	9	34.8	12.7	58.6
22	149	22.8		10.8	86	05.8	10.8	9	47.5	12.7	58.5
23	164	23.0		10.0	100	35.6	10.9	10	00.2	12.5	58.5
24 00	179	23.1	N11	09.1	115	05.5	10.9	S10	12.7	12.5	58.5
01	194	23.3		08.3	129	35.4	10.9	10	25.2	12.4	58.4
02	209	23.5		07.4	144	05.3	10.9	10	37.6	12.3	58.4
03	224	23.6	. .	06.6	158	35.2	10.9	10	49.9	12.3	58.3
04	239	23.8		05.7	173	05.1	10.9	11	02.2	12.2	58.3
05	254	24.0		04.9	187	35.0	10.9	11	14.4	12.1	58.3
06	269	24.1	N11	04.0	202	04.9	10.9	S11	26.5	12.0	58.2
07	284	24.3		03.1	216	34.8	10.9	11	38.5	12.0	58.2
V 08	299	24.5		02:3	231	04.7	10.9	11	50.5	11.9	58.1
I 09	314	24.6	. .	01.4	245	34.6	10.9	12	02.4	11.8	58.1
E 10	329	24.8	11	00.6	260	04.5	10.9	12	14.2	11.7	58.1
R 11	344	25.0	10	59.7	274	34.4	10.9	12	25.9	11.7	58.0
N 12	359	25.1	N10	58.9	289	04.3	10.8	S12	37.6	11.5	58.0
E 13	14	25.3		58.0	303	34.1	10.9	12	49.1	11.5	58.0
S 14	29	25.5		57.1	318	04.0	10.9	13	00.6	11.4	57.9
15	44	25.6	. .	56.3	332	33.9	10.8	13	12.0	11.3	57.9
16	59	25.8		55.4	347	03.7	10.9	13	23.3	11.2	57.8
17	74	26.0		54.6	1	33.6	10.8	13	34.5	11.2	57.8
18	89	26.1	N10	53.7	16	03.4	10.9	S13	45.7	11.0	57.8
19	104	26.3		52.9	30	33.3	10.8	13	56.7	11.0	57.7
20	119	26.5		52.0	45	03.1	10.8	14	07.7	10.8	57.7
21	134	26.7	. .	51.1	59	32.9	10.9	14	18.5	10.8	57.6
22	149	26.8		50.3	74	02.8	10.8	14	29.3	10.7	57.6
23	164	27.0		49.4	88	32.6	10.8	14	40.0	10.6	57.6
25 00	179	27.2	N10	48.5	103	02.4	10.7	S14	50.6	10.6	57.5
01	194	27.3		47.7	117	32.1	10.8	15	01.2	10.4	57.5
02	209	27.5		46.8	132	01.9	10.8	15	11.6	10.3	57.5
03	224	27.7	. .	46.0	146	31.7	10.8	15	21.9	10.3	57.4
04	239	27.9		45.1	161	01.5	10.7	15	32.2	10.1	57.4
05	254	28.0		44.2	175	31.2	10.7	15	42.3	10.1	57.3
06	269	28.2	N10	43.4	190	00.9	10.8	S15	52.4	9.9	57.3
07	284	28.4		42.5	204	30.7	10.7	16	02.3	9.9	57.3
S 08	299	28.5		41.7	219	00.4	10.7	16	12.2	9.8	57.2
A 09	314	28.7	. .	40.8	233	30.1	10.6	16	22.0	9.6	57.2
B 10	329	28.9		39.9	247	59.7	10.7	16	31.6	9.6	57.2
A 11	344	29.1		39.1	262	29.4	10.7	16	41.2	9.5	57.1
D 12	359	29.2	N10	38.2	276	59.1	10.6	S16	50.7	9.3	57.1
13	14	29.4		37.3	291	28.7	10.7	17	00.0	9.3	57.1
O 14	29	29.6		36.5	305	58.4	10.6	17	09.3	9.2	57.0
15	44	29.8	. .	35.6	320	28.0	10.6	17	18.5	9.1	57.0
16	59	29.9		34.7	334	57.6	10.6	17	27.6	8.9	56.9
17	74	30.1		33.9	349	27.2	10.6	17	36.5	8.9	56.9
18	89	30.3	N10	33.0	3	56.8	10.5	S17	45.4	8.8	56.9
19	104	30.4		32.1	18	26.3	10.6	17	54.2	8.7	56.8
20	119	30.6		31.3	32	55.9	10.5	18	02.9	8.5	56.8
21	134	30.8	. .	30.4	47	25.4	10.6	18	11.4	8.5	56.8
22	149	31.0		29.5	61	55.0	10.5	18	19.9	8.3	56.7
23	164	31.1		28.7	76	24.5	10.5	S18	28.2	8.3	56.7
	SD	15.8	d	0.9	SD	16.1			15.8		15.6

Lat.	Crepúsculo Náutico	Crepúsculo Civil	Orto Sol	Orto Luna 23	Orto Luna 24	Orto Luna 25	Orto Luna 26
°	h m	h m	h m	h m	h m	h m	h m
N 72	////	01 15	03 20	11 33	13 51	17 02	▬
N 70	////	02 09	03 40	11 21	13 25	15 40	▬
68	////	02 41	03 56	11 11	13 05	15 02	17 12
66	01 05	03 04	04 09	11 03	12 50	14 36	16 23
64	01 53	03 22	04 19	10 57	12 37	14 16	15 51
62	02 22	03 36	04 28	10 51	12 26	13 59	15 28
60	02 43	03 48	04 36	10 46	12 17	13 46	15 10
N 58	03 00	03 58	04 43	10 42	12 09	13 34	14 54
56	03 14	04 07	04 49	10 38	12 02	13 24	14 41
54	03 26	04 15	04 54	10 34	11 56	13 15	14 30
52	03 36	04 22	04 59	10 31	11 51	13 08	14 20
50	03 45	04 28	05 03	10 28	11 46	13 00	14 11
45	04 04	04 41	05 12	10 22	11 35	12 45	13 52
N 40	04 18	04 52	05 20	10 17	11 26	12 33	13 37
35	04 29	05 00	05 27	10 13	11 19	12 23	13 24
30	04 39	05 08	05 32	10 09	11 12	12 13	13 13
20	04 53	05 20	05 42	10 03	11 01	11 58	12 54
N 10	05 05	05 30	05 51	09 57	10 51	11 44	12 38
0	05 13	05 38	05 59	09 52	10 42	11 32	12 22
S 10	05 21	05 46	06 07	09 47	10 33	11 19	12 07
20	05 27	05 53	06 15	09 41	10 23	11 06	11 50
30	05 32	06 00	06 24	09 35	10 12	10 51	11 32
35	05 34	06 04	06 30	09 31	10 06	10 42	11 21
40	05 37	06 08	06 36	09 27	09 58	10 32	11 09
45	05 39	06 13	06 43	09 23	09 50	10 20	10 54
S 50	05 40	06 18	06 51	09 17	09 40	10 06	10 36
52	05 41	06 20	06 55	09 15	09 36	10 00	10 28
54	05 41	06 23	06 59	09 12	09 31	09 52	10 19
56	05 42	06 25	07 03	09 09	09 25	09 44	10 08
58	05 43	06 28	07 09	09 06	09 19	09 35	09 56
S 60	05 43	06 31	07 14	09 02	09 12	09 25	09 43

Lat.	Ocaso Sol	Crepúsculo Civil	Crepúsculo Náutico	Ocaso Luna 23	Ocaso Luna 24	Ocaso Luna 25	Ocaso Luna 26
°	h m	h m	h m	h m	h m	h m	h m
N 72	20 41	22 38	////	20 07	19 35	18 09	▬
N 70	20 21	21 50	////	20 22	20 03	19 32	▬
68	20 06	21 20	////	20 33	20 24	20 11	19 47
66	19 54	20 57	22 49	20 43	20 40	20 38	20 37
64	19 43	20 40	22 07	20 51	20 54	20 59	21 09
62	19 35	20 26	21 39	20 58	21 06	21 16	21 32
60	19 27	20 14	21 18	21 04	21 16	21 31	21 51
N 58	19 21	20 04	21 02	21 10	21 25	21 43	22 07
56	19 15	19 56	20 48	21 15	21 32	21 54	22 21
54	19 10	19 48	20 37	21 19	21 39	22 03	22 32
52	19 05	19 41	20 27	21 23	21 45	22 11	22 43
50	19 01	19 35	20 18	21 27	21 51	22 19	22 52
45	18 51	19 22	20 00	21 35	22 03	22 35	23 11
N 40	18 44	19 12	19 46	21 41	22 13	22 48	23 27
35	18 37	19 04	19 35	21 47	22 22	23 00	23 41
30	18 32	18 56	19 26	21 52	22 30	23 10	23 52
20	18 22	18 44	19 11	22 01	22 43	23 27	24 13
N 10	18 13	18 35	19 00	22 08	22 55	23 42	24 30
0	18 06	18 27	18 51	22 16	23 05	23 56	24 47
S 10	17 58	18 19	18 44	22 23	23 16	24 10	00 10
20	17 50	18 12	18 38	22 31	23 28	24 25	00 25
30	17 41	18 05	18 33	22 39	23 42	24 42	00 42
35	17 35	18 01	18 31	22 45	23 50	24 52	00 52
40	17 30	17 57	18 29	22 50	23 58	25 04	01 04
45	17 23	17 53	18 27	22 57	24 09	00 09	01 18
S 50	17 15	17 48	18 25	23 06	24 22	00 22	01 35
52	17 11	17 45	18 25	23 09	24 28	00 28	01 43
54	17 07	17 43	18 24	23 14	24 34	00 34	01 51
56	17 02	17 40	18 24	23 18	24 42	00 42	02 01
58	16 57	17 38	18 23	23 23	24 50	00 50	02 13
S 60	16 51	17 35	18 23	23 29	24 59	00 59	02 26

Día	SOL E.T. (−) 00h	SOL E.T. (−) 12h	SOL Pas. Mer.	LUNA Pas. Sup.	LUNA Mer. Inf.	LUNA Edad	LUNA Fase
d	m s	m s	h m	h m	h m	d	%
23	02 44	02 36	12 03	16 04	03 39	04	26
24	02 28	02 20	12 02	16 54	04 29	05	36
25	02 12	02 03	12 02	17 44	05 19	06	47

T.U.	ARIES	VENUS −4.0		MARTE −0.9		JUPITER −2.1		SATURNO +0.1	
	A.H.G.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
26 00	334 18.5	213 39.3	N20 06.6	71 28.9	S27 01.6	234 37.0	N22 55.1	261 23.0	N20 44.6
01	349 21.0	228 38.7	06.2	86 30.2	01.6	249 39.0	55.1	276 25.3	44.6
02	4 23.5	243 38.0	05.7	101 31.5	01.6	264 41.0	55.1	291 27.6	44.6
03	19 25.9	258 37.4 . .	05.2	116 32.8 . .	01.6	279 43.0 . .	55.0	306 29.9 . .	44.6
04	34 28.4	273 36.7	04.8	131 34.1	01.6	294 44.9	55.0	321 32.2	44.6
05	49 30.9	288 36.0	04.3	146 35.4	01.6	309 46.9	55.0	336 34.5	44.6
06	64 33.3	303 35.4	N20 03.8	161 36.7	S27 01.6	324 48.9	N22 55.0	351 36.9	N20 44.6
07	79 35.8	318 34.7	03.3	176 38.0	01.6	339 50.9	54.9	6 39.2	44.6
D 08	94 38.3	333 34.1	02.9	191 39.2	01.6	354 52.9	54.9	21 41.5	44.6
O 09	109 40.7	348 33.4 . .	02.4	206 40.5 . .	01.6	9 54.9 . .	54.9	36 43.8 . .	44.7
M 10	124 43.2	3 32.8	01.9	221 41.8	01.6	24 56.9	54.9	51 46.1	44.7
I 11	139 45.6	18 32.1	01.4	236 43.1	01.5	39 58.9	54.8	66 48.4	44.7
N 12	154 48.1	33 31.4	N20 00.9	251 44.4	S27 01.5	55 00.9	N22 54.8	81 50.8	N20 44.7
G 13	169 50.6	48 30.8	00.5	266 45.7	01.5	70 02.9	54.8	96 53.1	44.7
O 14	184 53.0	63 30.1	20 00.0	281 46.9	01.5	85 04.8	54.7	111 55.4	44.7
15	199 55.5	78 29.5	19 59.5	296 48.2 . .	01.5	100 06.8 . .	54.7	126 57.7 . .	44.7
16	214 58.0	93 28.8	59.0	311 49.5	01.5	115 08.8	54.7	142 00.0	44.7
17	230 00.4	108 28.2	58.5	326 50.8	01.5	130 10.8	54.7	157 02.4	44.7
18	245 02.9	123 27.5	N19 58.1	341 52.1	S27 01.5	145 12.8	N22 54.6	172 04.7	N20 44.8
19	260 05.4	138 26.9	57.6	356 53.3	01.5	160 14.8	54.6	187 07.0	44.8
20	275 07.8	153 26.2	57.1	11 54.6	01.5	175 16.8	54.6	202 09.3	44.8
21	290 10.3	168 25.5 . .	56.6	26 55.9 . .	01.5	190 18.8 . .	54.6	217 11.6 . .	44.8
22	305 12.8	183 24.9	56.1	41 57.2	01.5	205 20.8	54.5	232 14.0	44.8
23	320 15.2	198 24.2	55.6	56 58.4	01.5	220 22.8	54.5	247 16.3	44.8
27 00	335 17.7	213 23.6	N19 55.1	71 59.7	S27 01.5	235 24.8	N22 54.5	262 18.6	N20 44.8
01	350 20.1	228 22.9	54.6	87 01.0	01.5	250 26.7	54.5	277 20.9	44.8
02	5 22.6	243 22.3	54.1	102 02.3	01.5	265 28.7	54.4	292 23.2	44.8
03	20 25.1	258 21.6 . .	53.6	117 03.5 . .	01.5	280 30.7 . .	54.4	307 25.6 . .	44.8
04	35 27.5	273 21.0	53.1	132 04.8	01.5	295 32.7	54.4	322 27.9	44.9
05	50 30.0	288 20.3	52.7	147 06.1	01.5	310 34.7	54.3	337 30.2	44.9
06	65 32.5	303 19.7	N19 52.2	162 07.3	S27 01.5	325 36.7	N22 54.3	352 32.5	N20 44.9
07	80 34.9	318 19.0	51.7	177 08.6	01.5	340 38.7	54.3	7 34.8	44.9
L 08	95 37.4	333 18.3	51.2	192 09.9	01.5	355 40.7	54.3	22 37.2	44.9
U 09	110 39.9	348 17.7 . .	50.7	207 11.1 . .	01.4	10 42.7 . .	54.2	37 39.5 . .	44.9
10	125 42.3	3 17.0	50.2	222 12.4	01.4	25 44.7	54.2	52 41.8	44.9
N 11	140 44.8	18 16.4	49.7	237 13.7	01.4	40 46.7	54.2	67 44.1	44.9
12	155 47.2	33 15.7	N19 49.2	252 14.9	S27 01.4	55 48.7	N22 54.2	82 46.4	N20 44.9
E 13	170 49.7	48 15.1	48.6	267 16.2	01.4	70 50.7	54.1	97 48.8	45.0
14	185 52.2	63 14.4	48.1	282 17.5	01.4	85 52.7	54.1	112 51.1	45.0
S 15	200 54.6	78 13.8 . .	47.6	297 18.7 . .	01.4	100 54.7 . .	54.1	127 53.4 . .	45.0
16	215 57.1	93 13.1	47.1	312 20.0	01.4	115 56.7	54.1	142 55.7	45.0
17	230 59.6	108 12.5	46.6	327 21.2	01.4	130 58.7	54.0	157 58.1	45.0
18	246 02.0	123 11.8	N19 46.1	342 22.5	S27 01.4	146 00.6	N22 54.0	173 00.4	N20 45.0
19	261 04.5	138 11.2	45.6	357 23.7	01.4	161 02.6	54.0	188 02.7	45.0
20	276 07.0	153 10.5	45.1	12 25.0	01.4	176 04.6	53.9	203 05.0	45.0
21	291 09.4	168 09.9 . .	44.6	27 26.3 . .	01.4	191 06.6 . .	53.9	218 07.4 . .	45.0
22	306 11.9	183 09.2	44.1	42 27.5	01.4	206 08.6	53.9	233 09.7	45.0
23	321 14.4	198 08.6	43.6	57 28.8	01.4	221 10.6	53.9	248 12.0	45.1
28 00	336 16.8	213 07.9	N19 43.0	72 30.0	S27 01.3	236 12.6	N22 53.8	263 14.3	N20 45.1
01	351 19.3	228 07.3	42.5	87 31.3	01.3	251 14.6	53.8	278 16.7	45.1
02	6 21.7	243 06.6	42.0	102 32.5	01.3	266 16.6	53.8	293 19.0	45.1
03	21 24.2	258 06.0 . .	41.5	117 33.8 . .	01.3	281 18.6 . .	53.8	308 21.3 . .	45.1
04	36 26.7	273 05.3	41.0	132 35.0	01.3	296 20.6	53.7	323 23.6	45.1
05	51 29.1	288 04.7	40.5	147 36.3	01.3	311 22.6	53.7	338 26.0	45.1
06	66 31.6	303 04.0	N19 39.9	162 37.5	S27 01.3	326 24.6	N22 53.7	353 28.3	N20 45.1
07	81 34.1	318 03.4	39.4	177 38.7	01.3	341 26.6	53.6	8 30.6	45.1
M 08	96 36.5	333 02.7	38.9	192 40.0	01.3	356 28.6	53.6	23 32.9	45.2
A 09	111 39.0	348 02.1 . .	38.4	207 41.2 . .	01.3	11 30.6 . .	53.6	38 35.3 . .	45.2
R 10	126 41.5	3 01.4	37.8	222 42.5	01.3	26 32.6	53.6	53 37.6	45.2
T 11	141 43.9	18 00.8	37.3	237 43.7	01.2	41 34.6	53.5	68 39.9	45.2
12	156 46.4	33 00.1	N19 36.8	252 45.0	S27 01.2	56 36.6	N22 53.5	83 42.2	N20 45.2
E 13	171 48.9	47 59.5	36.3	267 46.2	01.2	71 38.6	53.5	98 44.6	45.2
14	186 51.3	62 58.8	35.7	282 47.4	01.2	86 40.6	53.5	113 46.9	45.2
S 15	201 53.8	77 58.2 . .	35.2	297 48.7 . .	01.2	101 42.6 . .	53.4	128 49.2 . .	45.2
16	216 56.2	92 57.6	34.7	312 49.9	01.2	116 44.6	53.4	143 51.5	45.2
17	231 58.7	107 56.9	34.2	327 51.2	01.2	131 46.6	53.4	158 53.9	45.2
18	247 01.2	122 56.3	N19 33.6	342 52.4	S27 01.2	146 48.6	N22 53.3	173 56.2	N20 45.3
19	262 03.6	137 55.6	33.1	357 53.6	01.2	161 50.6	53.3	188 58.5	45.3
20	277 06.1	152 55.0	32.6	12 54.9	01.2	176 52.6	53.3	204 00.8	45.3
21	292 08.6	167 54.3 . .	32.0	27 56.1 . .	01.1	191 54.6 . .	53.3	219 03.2 . .	45.3
22	307 11.0	182 53.7	31.5	42 57.3	01.1	206 56.6	53.2	234 05.5	45.3
23	322 13.5	197 53.0	30.9	57 58.6	01.1	221 58.6	53.2	249 07.8	45.3
	h m								
Pas. Mer.	1 38.6	v −0.7	d 0.5	v 1.3	d 0.0	v 2.0	d 0.0	v 2.3	d 0.0

ESTRELLAS		
Nombre	A.H.S.	Dec.
	° ′	° ′
Acamar	315 25.2	S40 17.7
Achernar	335 33.2	S57 13.5
Acrux	173 20.4	S63 06.5
Adhara	255 20.1	S28 58.2
Aldebaran	291 00.1	N16 30.7
Alioth	166 29.1	N55 57.4
Alkaid	153 06.4	N49 18.7
Al Na'ir	27 54.8	S46 57.2
Alnilam	275 55.9	S 1 11.9
Alphard	218 05.5	S 8 39.7
Alphecca	126 18.9	N26 42.9
Alpheratz	357 52.8	N29 05.9
Altair	62 17.0	N 8 52.5
Ankaa	353 24.4	S42 17.7
Antares	112 37.6	S26 26.1
Arcturus	146 04.3	N19 10.7
Atria	107 47.8	S69 02.0
Avior	234 22.4	S59 30.6
Bellatrix	278 42.1	N 6 21.1
Betelgeuse	271 11.5	N 7 24.5
Canopus	264 00.6	S52 41.5
Capella	280 48.3	N45 59.8
Deneb	49 37.4	N45 17.3
Denebola	182 43.4	N14 34.0
Diphda	349 04.9	S17 58.6
Dubhe	194 03.5	N61 44.7
Elnath	278 24.5	N28 36.5
Eltanin	90 50.2	N51 29.6
Enif	33 55.9	N 9 53.0
Fomalhaut	15 33.8	S29 36.8
Gacrux	172 11.9	S57 07.3
Gienah	176 02.2	S17 32.9
Hadar	149 01.6	S60 22.9
Hamal	328 11.1	N23 28.1
Kaus Aust.	83 55.9	S34 23.1
Kochab	137 19.9	N74 09.3
Markab	13 47.3	N15 12.8
Menkar	314 24.7	N 4 05.8
Menkent	148 18.8	S36 22.7
Miaplacidus	221 42.7	S69 43.2
Mirfak	308 53.6	N49 51.8
Nunki	76 09.6	S26 17.7
Peacock	53 33.2	S56 43.9
Pollux	243 39.3	N28 01.4
Procyon	245 09.7	N 5 13.4
Rasalhague	96 14.9	N12 33.7
Regulus	207 53.7	N11 57.8
Rigel	281 21.1	S 8 11.9
Rigil Kent.	140 04.9	S60 50.6
Sabik	102 23.1	S15 43.5
Schedar	349 50.8	N56 32.6
Shaula	96 34.4	S37 06.4
Sirius	258 42.1	S16 42.9
Spica	158 41.3	S11 10.0
Suhail	222 59.7	S43 26.1
Vega	80 45.0	N38 47.4
Zuben'ubi	137 15.8	S16 02.8

	A.H.S.	Pas. Mer.
	° ′	h m
Venus	238 05.9	9 47
Marte	96 42.0	19 10
Júpiter	260 07.1	8 17
Saturno	287 00.9	6 30

T.U.	SOL				LUNA						
	A.H.G.		Dec.		A.H.G.	v	Dec.		d	P.H.	
d h	°	′	°	′	°	′	′	°	′	′	′
26 00	179	31.3	N10	27.8	90	54.0	10.5	S18	36.5	8.1	56.7
01	194	31.5		26.9	105	23.5	10.5	18	44.6	8.1	56.6
02	209	31.7		26.1	119	53.0	10.4	18	52.7	7.9	56.6
03	224	31.9	. .	25.2	134	22.4	10.5	19	00.6	7.8	56.6
04	239	32.0		24.3	148	51.9	10.4	19	08.4	7.7	56.5
05	254	32.2		23.4	163	21.3	10.4	19	16.1	7.7	56.5
06	269	32.4	N10	22.6	177	50.7	10.4	S19	23.8	7.5	56.5
07	284	32.6		21.7	192	20.1	10.4	19	31.3	7.3	56.4
08	299	32.7		20.8	206	49.5	10.4	19	38.6	7.3	56.4
09	314	32.9	. .	20.0	221	18.9	10.4	19	45.9	7.2	56.4
10	329	33.1		19.1	235	48.3	10.3	19	53.1	7.1	56.3
11	344	33.3		18.2	250	17.6	10.4	20	00.2	6.9	56.3
12	359	33.4	N10	17.4	264	47.0	10.3	S20	07.1	6.9	56.3
13	14	33.6		16.5	279	16.3	10.3	20	14.0	6.7	56.2
14	29	33.8		15.6	293	45.6	10.3	20	20.7	6.6	56.2
15	44	34.0	. .	14.7	308	14.9	10.3	20	27.3	6.5	56.2
16	59	34.2		13.9	322	44.2	10.3	20	33.8	6.4	56.2
17	74	34.3		13.0	337	13.5	10.3	20	40.2	6.3	56.1
18	89	34.5	N10	12.1	351	42.8	10.2	S20	46.5	6.2	56.1
19	104	34.7		11.2	6	12.0	10.3	20	52.7	6.0	56.1
20	119	34.9		10.4	20	41.3	10.2	20	58.7	6.0	56.0
21	134	35.0	. .	09.5	35	10.5	10.3	21	04.7	5.8	56.0
22	149	35.2		08.6	49	39.8	10.2	21	10.5	5.7	56.0
23	164	35.4		07.7	64	09.0	10.2	21	16.2	5.6	55.9
27 00	179	35.6	N10	06.9	78	38.2	10.2	S21	21.8	5.5	55.9
01	194	35.8		06.0	93	07.4	10.2	21	27.3	5.4	55.9
02	209	35.9		05.1	107	36.6	10.2	21	32.7	5.3	55.9
03	224	36.1	. .	04.2	122	05.8	10.2	21	38.0	5.1	55.8
04	239	36.3		03.4	136	35.0	10.1	21	43.1	5.0	55.8
05	254	36.5		02.5	151	04.1	10.2	21	48.1	4.9	55.8
06	269	36.7	N10	01.6	165	33.3	10.2	S21	53.0	4.8	55.7
07	284	36.8	10	00.7	180	02.5	10.1	21	57.8	4.7	55.7
08	299	37.0	9	59.9	194	31.6	10.2	22	02.5	4.6	55.7
09	314	37.2	. .	59.0	209	00.8	10.1	22	07.1	4.4	55.7
10	329	37.4		58.1	223	29.9	10.2	22	11.5	4.3	55.6
11	344	37.6		57.2	237	59.1	10.1	22	15.8	4.2	55.6
12	359	37.8	N 9	56.4	252	28.2	10.1	S22	20.0	4.1	55.6
13	14	37.9		55.5	266	57.3	10.2	22	24.1	4.0	55.6
14	29	38.1		54.6	281	26.5	10.1	22	28.1	3.9	55.5
15	44	38.3	. .	53.7	295	55.6	10.1	22	32.0	3.7	55.5
16	59	38.5		52.8	310	24.7	10.2	22	35.7	3.6	55.5
17	74	38.7		52.0	324	53.9	10.1	22	39.3	3.5	55.5
18	89	38.8	N 9	51.1	339	23.0	10.1	S22	42.8	3.4	55.4
19	104	39.0		50.2	353	52.1	10.2	22	46.2	3.3	55.4
20	119	39.2		49.3	8	21.3	10.1	22	49.5	3.1	55.4
21	134	39.4	. .	48.4	22	50.4	10.1	22	52.6	3.1	55.4
22	149	39.6		47.6	37	19.5	10.2	22	55.7	2.9	55.3
23	164	39.8		46.7	51	48.7	10.1	22	58.6	2.8	55.3
28 00	179	39.9	N 9	45.8	66	17.8	10.1	S23	01.4	2.6	55.3
01	194	40.1		44.9	80	46.9	10.2	23	04.0	2.6	55.3
02	209	40.3		44.0	95	16.1	10.1	23	06.6	2.4	55.2
03	224	40.5	. .	43.1	109	45.2	10.2	23	09.0	2.3	55.2
04	239	40.7		42.3	124	14.4	10.2	23	11.3	2.2	55.2
05	254	40.9		41.4	138	43.6	10.1	23	13.5	2.1	55.2
06	269	41.0	N 9	40.5	153	12.7	10.2	S23	15.6	2.0	55.1
07	284	41.2		39.6	167	41.9	10.2	23	17.6	1.8	55.1
08	299	41.4		38.7	182	11.1	10.2	23	19.4	1.7	55.1
09	314	41.6	. .	37.9	196	40.3	10.2	23	21.1	1.7	55.1
10	329	41.8		37.0	211	09.5	10.2	23	22.8	1.4	55.1
11	344	42.0		36.1	225	38.7	10.3	23	24.2	1.4	55.0
12	359	42.2	N 9	35.2	240	08.0	10.2	S23	25.6	1.3	55.0
13	14	42.3		34.3	254	37.2	10.2	23	26.9	1.1	55.0
14	29	42.5		33.4	269	06.4	10.3	23	28.0	1.0	55.0
15	44	42.7	. .	32.5	283	35.7	10.3	23	29.0	0.9	55.0
16	59	42.9		31.7	298	05.0	10.3	23	29.9	0.8	54.9
17	74	43.1		30.8	312	34.3	10.3	23	30.7	0.6	54.9
18	89	43.3	N 9	29.9	327	03.6	10.3	S23	31.3	0.6	54.9
19	104	43.5		29.0	341	32.9	10.4	23	31.9	0.4	54.9
20	119	43.6		28.1	356	02.3	10.3	23	32.3	0.3	54.9
21	134	43.8	. .	27.2	10	31.6	10.4	23	32.6	0.2	54.8
22	149	44.0		26.3	25	01.0	10.4	23	32.8	0.1	54.8
23	164	44.2		25.5	39	30.4	10.4	S23	32.9	0.1	54.8
	SD	15.9	d	0.9	SD	15.3		15.1			15.0

DOMINGO LUNES MARTES

Lat.	Crepúsculo Náutico	Crepúsculo Civil	Orto Sol	Orto Luna 26	Orto Luna 27	Orto Luna 28	Orto Luna 29
°	h m	h m	h m	h m	h m	h m	h m
N 72	////	01 50	03 36	▬	▬	▬	▬
N 70	////	02 30	03 53	▬	▬	▬	▬
68	////	02 56	04 07	17 12	▬	▬	▬
66	01 35	03 16	04 19	16 23	18 07	19 32	20 03
64	02 10	03 32	04 28	15 51	17 19	18 28	19 10
62	02 35	03 45	04 36	15 28	16 48	17 53	18 38
60	02 54	03 56	04 43	15 10	16 25	17 28	18 14
N 58	03 09	04 06	04 49	14 54	16 07	17 08	17 55
56	03 22	04 14	04 54	14 41	15 51	16 51	17 39
54	03 33	04 21	04 59	14 30	15 38	16 37	17 25
52	03 43	04 27	05 04	14 20	15 27	16 25	17 13
50	03 51	04 33	05 07	14 11	15 16	16 14	17 02
45	04 08	04 45	05 16	13 52	14 55	15 51	16 40
N 40	04 21	04 55	05 23	13 37	14 38	15 33	16 22
35	04 32	05 03	05 29	13 24	14 23	15 18	16 07
30	04 41	05 10	05 34	13 13	14 10	15 04	15 54
20	04 54	05 21	05 43	12 54	13 49	14 42	15 32
N 10	05 05	05 30	05 51	12 38	13 30	14 22	15 13
0	05 13	05 37	05 58	12 22	13 13	14 04	14 55
S 10	05 19	05 44	06 05	12 07	12 56	13 46	14 37
20	05 25	05 50	06 13	11 50	12 37	13 27	14 17
30	05 29	05 57	06 21	11 32	12 16	13 04	13 55
35	05 31	06 00	06 26	11 21	12 04	12 51	13 42
40	05 32	06 04	06 31	11 09	11 50	12 36	13 27
45	05 34	06 08	06 37	10 54	11 33	12 18	13 09
S 50	05 35	06 12	06 45	10 36	11 12	11 56	12 47
52	05 35	06 14	06 48	10 28	11 03	11 45	12 36
54	05 35	06 16	06 52	10 19	10 52	11 33	12 24
56	05 35	06 18	06 56	10 08	10 39	11 19	12 10
58	05 35	06 20	07 01	09 56	10 25	11 03	11 54
S 60	05 35	06 23	07 06	09 43	10 08	10 44	11 35

Lat.	Ocaso Sol	Crepúsculo Civil	Crepúsculo Náutico	Ocaso Luna 26	Ocaso Luna 27	Ocaso Luna 28	Ocaso Luna 29
°	h m	h m	h m	h m	h m	h m	h m
N 72	20 23	22 05	////	▬	▬	▬	▬
N 70	20 06	21 28	////	▬	▬	▬	▬
68	19 53	21 03	23 28	19 47	▬	▬	▬
66	19 42	20 43	22 21	20 37	20 39	21 00	22 14
64	19 33	20 28	21 48	21 09	21 27	22 05	23 07
62	19 25	20 15	21 24	21 32	21 58	22 39	23 39
60	19 18	20 05	21 06	21 51	22 21	23 05	24 03
N 58	19 12	19 55	20 51	22 07	22 40	23 25	24 22
56	19 07	19 47	20 39	22 21	22 56	23 41	24 37
54	19 03	19 40	20 28	22 32	23 09	23 56	24 51
52	18 58	19 34	20 19	22 43	23 21	24 08	00 08
50	18 55	19 29	20 11	22 52	23 31	24 19	00 19
45	18 46	19 17	19 54	23 11	23 53	24 41	00 41
N 40	18 39	19 07	19 41	23 27	24 11	00 11	01 00
35	18 33	19 00	19 30	23 41	24 26	00 26	01 15
30	18 28	18 53	19 22	23 52	24 39	00 39	01 28
20	18 20	18 42	19 08	24 13	00 13	01 01	01 51
N 10	18 12	18 33	18 58	24 30	00 30	01 20	02 10
0	18 05	18 26	18 50	24 47	00 47	01 38	02 29
S 10	17 58	18 19	18 44	00 10	01 03	01 56	02 47
20	17 51	18 13	18 39	00 25	01 21	02 15	03 06
30	17 42	18 07	18 34	00 42	01 41	02 37	03 29
35	17 38	18 03	18 33	00 52	01 53	02 50	03 42
40	17 32	18 00	18 31	01 04	02 07	03 05	03 57
45	17 26	17 56	18 30	01 18	02 23	03 22	04 15
S 50	17 19	17 52	18 29	01 35	02 43	03 44	04 38
52	17 16	17 50	18 29	01 43	02 52	03 55	04 48
54	17 12	17 48	18 29	01 51	03 03	04 07	05 00
56	17 08	17 46	18 29	02 01	03 15	04 21	05 14
58	17 03	17 44	18 29	02 13	03 29	04 36	05 31
S 60	16 58	17 41	18 29	02 26	03 46	04 56	05 50

Día	SOL E.T. (−) 00h	SOL E.T. (−) 12h	SOL Pas. Mer.	LUNA Pas. Sup.	LUNA Mer. Inf.	LUNA Edad	LUNA Fase
d	m s	m s	h m	h m	h m	d	%
26	01 55	01 47	12 02	18 34	06 09	07	57
27	01 38	01 29	12 01	19 25	07 00	08	67
28	01 21	01 12	12 01	20 16	07 51	09	76

T.U.	ARIES	VENUS −4.0		MARTE −0.9		JUPITER −2.1		SATURNO +0.1	
d h	A.H.G.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.
	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
29 00	337 16.0	212 52.4	N19 30.4	72 59.8	S27 01.1	237 00.6	N22 53.2	264 10.2	N20 45.3
01	352 18.4	227 51.7	29.9	88 01.0	01.1	252 02.6	53.2	279 12.5	45.3
02	7 20.9	242 51.1	29.3	103 02.3	01.1	267 04.6	53.1	294 14.8	45.3
03	22 23.4	257 50.5	28.8	118 03.5	01.1	282 06.6	53.1	309 17.1	45.3
04	37 25.8	272 49.8	28.2	133 04.7	01.1	297 08.6	53.1	324 19.5	45.3
05	52 28.3	287 49.2	27.7	148 05.9	01.1	312 10.6	53.1	339 21.8	45.4
06	67 30.7	302 48.5	N19 27.2	163 07.2	S27 01.0	327 12.6	N22 53.0	354 24.1	N20 45.4
M 07	82 33.2	317 47.9	26.6	178 08.4	01.0	342 14.6	53.0	9 26.5	45.4
I 08	97 35.7	332 47.2	26.1	193 09.6	01.0	357 16.6	53.0	24 28.8	45.4
E 09	112 38.1	347 46.6	25.5	208 10.8	01.0	12 18.6	52.9	39 31.1	45.4
R 10	127 40.6	2 46.0	25.0	223 12.1	01.0	27 20.6	52.9	54 33.5	45.4
C 11	142 43.1	17 45.3	24.4	238 13.3	01.0	42 22.6	52.9	69 35.8	45.4
O 12	157 45.5	32 44.7	N19 23.9	253 14.5	S27 01.0	57 24.6	N22 52.9	84 38.1	N20 45.4
L 13	172 48.0	47 44.0	23.3	268 15.7	00.9	72 26.6	52.8	99 40.4	45.4
E 14	187 50.5	62 43.4	22.8	283 16.9	00.9	87 28.6	52.8	114 42.8	45.4
S 15	202 52.9	77 42.7	22.2	298 18.2	00.9	102 30.6	52.8	129 45.1	45.5
16	217 55.4	92 42.1	21.7	313 19.4	00.9	117 32.6	52.8	144 47.4	45.5
17	232 57.8	107 41.5	21.1	328 20.6	00.9	132 34.7	52.7	159 49.8	45.5
18	248 00.3	122 40.8	N19 20.6	343 21.8	S27 00.9	147 36.7	N22 52.7	174 52.1	N20 45.5
19	263 02.8	137 40.2	20.0	358 23.0	00.9	162 38.7	52.7	189 54.4	45.5
20	278 05.2	152 39.5	19.5	13 24.2	00.9	177 40.7	52.6	204 56.8	45.5
21	293 07.7	167 38.9	18.9	28 25.5	00.8	192 42.7	52.6	219 59.1	45.5
22	308 10.2	182 38.3	18.3	43 26.7	00.8	207 44.7	52.6	235 01.4	45.5
23	323 12.6	197 37.6	17.8	58 27.9	00.8	222 46.7	52.6	250 03.8	45.5
30 00	338 15.1	212 37.0	N19 17.2	73 29.1	S27 00.8	237 48.7	N22 52.5	265 06.1	N20 45.5
01	353 17.6	227 36.3	16.7	88 30.3	00.8	252 50.7	52.5	280 08.4	45.5
02	8 20.0	242 35.7	16.1	103 31.5	00.8	267 52.7	52.5	295 10.8	45.6
03	23 22.5	257 35.1	15.5	118 32.7	00.7	282 54.7	52.4	310 13.1	45.6
04	38 25.0	272 34.4	15.0	133 33.9	00.7	297 56.7	52.4	325 15.4	45.6
05	53 27.4	287 33.8	14.4	148 35.1	00.7	312 58.7	52.4	340 17.8	45.6
06	68 29.9	302 33.1	N19 13.8	163 36.3	S27 00.7	328 00.7	N22 52.4	355 20.1	N20 45.6
07	83 32.3	317 32.5	13.3	178 37.6	00.7	343 02.7	52.3	10 22.4	45.6
J 08	98 34.8	332 31.9	12.7	193 38.8	00.7	358 04.7	52.3	25 24.8	45.6
U 09	113 37.3	347 31.2	12.1	208 40.0	00.7	13 06.7	52.3	40 27.1	45.6
E 10	128 39.7	2 30.6	11.6	223 41.2	00.6	28 08.8	52.3	55 29.4	45.6
V 11	143 42.2	17 30.0	11.0	238 42.4	00.6	43 10.8	52.2	70 31.8	45.6
E 12	158 44.7	32 29.3	N19 10.4	253 43.6	S27 00.6	58 12.8	N22 52.2	85 34.1	N20 45.6
S 13	173 47.1	47 28.7	09.8	268 44.8	00.6	73 14.8	52.2	100 36.4	45.7
14	188 49.6	62 28.0	09.3	283 46.0	00.6	88 16.8	52.1	115 38.8	45.7
15	203 52.1	77 27.4	08.7	298 47.2	00.6	103 18.8	52.1	130 41.1	45.7
16	218 54.5	92 26.8	08.1	313 48.4	00.5	118 20.8	52.1	145 43.4	45.7
17	233 57.0	107 26.1	07.5	328 49.6	00.5	133 22.8	52.1	160 45.8	45.7
18	248 59.5	122 25.5	N19 07.0	343 50.8	S27 00.5	148 24.8	N22 52.0	175 48.1	N20 45.7
19	264 01.9	137 24.9	06.4	358 51.9	00.5	163 26.8	52.0	190 50.5	45.7
20	279 04.4	152 24.2	05.8	13 53.1	00.5	178 28.8	52.0	205 52.8	45.7
21	294 06.8	167 23.6	05.2	28 54.3	00.4	193 30.9	52.0	220 55.1	45.7
22	309 09.3	182 23.0	04.6	43 55.5	00.4	208 32.9	51.9	235 57.5	45.7
23	324 11.8	197 22.3	04.1	58 56.7	00.4	223 34.9	51.9	250 59.8	45.7
31 00	339 14.2	212 21.7	N19 03.5	73 57.9	S27 00.4	238 36.9	N22 51.9	266 02.1	N20 45.8
01	354 16.7	227 21.1	02.9	88 59.1	00.4	253 38.9	51.8	281 04.5	45.8
02	9 19.2	242 20.4	02.3	104 00.3	00.4	268 40.9	51.8	296 06.8	45.8
03	24 21.6	257 19.8	01.7	119 01.5	00.3	283 42.9	51.8	311 09.2	45.8
04	39 24.1	272 19.2	01.1	134 02.7	00.3	298 44.9	51.8	326 11.5	45.8
05	54 26.6	287 18.5	00.5	149 03.9	00.3	313 46.9	51.7	341 13.8	45.8
06	69 29.0	302 17.9	N19 00.0	164 05.0	S27 00.3	328 49.0	N22 51.7	356 16.2	N20 45.8
07	84 31.5	317 17.3	18 59.4	179 06.2	00.3	343 51.0	51.7	11 18.5	45.8
V 08	99 33.9	332 16.6	58.8	194 07.4	00.2	358 53.0	51.7	26 20.8	45.8
I 09	114 36.4	347 16.0	58.2	209 08.6	00.2	13 55.0	51.6	41 23.2	45.8
E 10	129 38.9	2 15.4	57.6	224 09.8	00.2	28 57.0	51.6	56 25.5	45.8
R 11	144 41.3	17 14.7	57.0	239 11.0	00.2	43 59.0	51.6	71 27.9	45.8
N 12	159 43.8	32 14.1	N18 56.4	254 12.1	S27 00.2	59 01.0	N22 51.5	86 30.2	N20 45.9
E 13	174 46.3	47 13.5	55.8	269 13.3	00.1	74 03.0	51.5	101 32.5	45.9
S 14	189 48.7	62 12.8	55.2	284 14.5	00.1	89 05.1	51.5	116 34.9	45.9
15	204 51.2	77 12.2	54.6	299 15.7	00.1	104 07.1	51.5	131 37.2	45.9
16	219 53.7	92 11.6	54.0	314 16.9	00.1	119 09.1	51.4	146 39.6	45.9
17	234 56.1	107 10.9	53.4	329 18.0	00.0	134 11.1	51.4	161 41.9	45.9
18	249 58.6	122 10.3	N18 52.8	344 19.2	S27 00.0	149 13.1	N22 51.4	176 44.2	N20 45.9
19	265 01.1	137 09.7	52.2	359 20.4	00.0	164 15.1	51.3	191 46.6	45.9
20	280 03.5	152 09.1	51.6	14 21.6	00.0	179 17.1	51.3	206 48.9	45.9
21	295 06.0	167 08.4	51.0	29 22.8	27 00.0	194 19.2	51.3	221 51.3	45.9
22	310 08.4	182 07.8	50.4	44 23.9	26 59.9	209 21.2	51.3	236 53.6	45.9
23	325 10.9	197 07.2	49.8	59 25.1	S26 59.9	224 23.2	51.2	251 55.9	45.9
	h m								
Pas. Mer.	1 26.8	v −0.6	d 0.6	v 1.2	d 0.0	v 2.0	d 0.0	v 2.3	d 0.0

ESTRELLAS

Nombre	A.H.S.	Dec.
	° ′	° ′
Acamar	315 25.2	S40 17.7
Achernar	335 33.2	S57 13.5
Acrux	173 20.4	S63 06.5
Adhara	255 20.0	S28 58.2
Aldebaran	291 00.1	N16 30.7
Alioth	166 29.1	N55 57.4
Alkaid	153 06.4	N49 18.7
Al Na'ir	27 54.8	S46 57.2
Alnilam	275 55.9	S 1 11.9
Alphard	218 05.5	S 8 39.7
Alphecca	126 18.9	N26 42.9
Alpheratz	357 52.8	N29 05.9
Altair	62 17.0	N 8 52.5
Ankaa	353 24.4	S42 17.7
Antares	112 37.6	S26 26.1
Arcturus	146 04.3	N19 10.7
Atria	107 47.8	S69 02.0
Avior	234 22.4	S59 30.6
Bellatrix	278 42.0	N 6 21.1
Betelgeuse	271 11.5	N 7 24.5
Canopus	264 00.5	S52 41.5
Capella	280 48.3	N45 59.8
Deneb	49 37.4	N45 17.3
Denebola	182 43.4	N14 34.0
Diphda	349 04.9	S17 58.6
Dubhe	194 03.5	N61 44.7
Elnath	278 24.4	N28 36.5
Eltanin	90 50.2	N51 29.6
Enif	33 55.9	N 9 53.0
Fomalhaut	15 33.8	S29 36.8
Gacrux	172 11.9	S57 07.3
Gienah	176 02.2	S17 32.9
Hadar	149 01.6	S60 22.9
Hamal	328 11.1	N23 28.1
Kaus Aust.	83 55.9	S34 23.1
Kochab	137 19.9	N74 09.3
Markab	13 47.3	N15 12.9
Menkar	314 24.6	N 4 05.8
Menkent	148 18.8	S36 22.6
Miaplacidus	221 42.7	S69 43.2
Mirfak	308 53.6	N49 51.8
Nunki	76 09.6	S26 17.7
Peacock	53 33.2	S56 43.9
Pollux	243 39.3	N28 01.4
Procyon	245 09.7	N 5 13.4
Rasalhague	96 15.0	N12 33.7
Regulus	207 53.7	N11 57.8
Rigel	281 21.0	S 8 11.8
Rigil Kent.	140 04.9	S60 50.6
Sabik	102 23.1	S15 43.5
Schedar	349 50.8	N56 32.6
Shaula	96 34.4	S37 06.4
Sirius	258 42.1	S16 42.9
Spica	158 41.3	S11 10.0
Suhail	222 59.7	S43 26.1
Vega	80 45.0	N38 47.4
Zuben'ubi	137 15.8	S16 02.8

	A.H.S.	Pas. Mer.
	° ′	h m
Venus	234 21.9	9 50
Marte	95 14.0	19 05
Júpiter	259 33.6	8 08
Saturno	286 51.0	6 19

T.U.	SOL			LUNA					
	A.H.G.		Dec.	A.H.G.	v	Dec.	d	P.H.	
d h	° ′		° ′	° ′	′	° ′	′	′	
29 00	179 44.4	N	9 24.6	53 59.8	10.4	S23 32.8	0.1	54.8	
01	194 44.6		23.7	68 29.2	10.5	23 32.7	0.3	54.8	
02	209 44.8		22.8	82 58.7	10.5	23 32.4	0.4	54.7	
03	224 45.0	. .	21.9	97 28.2	10.5	23 32.0	0.5	54.7	
04	239 45.1		21.0	111 57.7	10.5	23 31.5	0.6	54.7	
05	254 45.3		20.1	126 27.2	10.6	23 30.9	0.7	54.7	
06	269 45.5	N	9 19.2	140 56.8	10.5	S23 30.2	0.9	54.7	
M 07	284 45.7		18.3	155 26.3	10.6	23 29.3	1.0	54.7	
I 08	299 45.9		17.5	169 55.9	10.6	23 28.3	1.0	54.6	
E 09	314 46.1	. .	16.6	184 25.5	10.7	23 27.3	1.2	54.6	
R 10	329 46.3		15.7	198 55.2	10.7	23 26.1	1.3	54.6	
C 11	344 46.5		14.8	213 24.9	10.7	23 24.8	1.5	54.6	
O 12	359 46.7	N	9 13.9	227 54.6	10.7	S23 23.3	1.5	54.6	
L 13	14 46.8		13.0	242 24.3	10.8	23 21.8	1.7	54.6	
E 14	29 47.0		12.1	256 54.1	10.7	23 20.1	1.7	54.5	
S 15	44 47.2	. .	11.2	271 23.8	10.9	23 18.4	1.9	54.5	
16	59 47.4		10.3	285 53.7	10.8	23 16.5	2.0	54.5	
17	74 47.6		09.4	300 23.5	10.9	23 14.5	2.1	54.5	
18	89 47.8	N	9 08.5	314 53.4	10.9	S23 12.4	2.2	54.5	
19	104 48.0		07.6	329 23.3	10.9	23 10.2	2.3	54.5	
20	119 48.2		06.8	343 53.2	11.0	23 07.9	2.4	54.5	
21	134 48.4	. .	05.9	358 23.2	11.0	23 05.5	2.6	54.4	
22	149 48.6		05.0	12 53.2	11.1	23 02.9	2.6	54.4	
23	164 48.8		04.1	27 23.3	11.1	23 00.3	2.8	54.4	
30 00	179 48.9	N	9 03.2	41 53.4	11.1	S22 57.5	2.8	54.4	
01	194 49.1		02.3	56 23.5	11.1	22 54.7	3.0	54.4	
02	209 49.3		01.4	70 53.6	11.2	22 51.7	3.1	54.4	
03	224 49.5		9 00.5	85 23.8	11.2	22 48.6	3.2	54.4	
04	239 49.7		8 59.6	99 54.0	11.3	22 45.4	3.3	54.4	
05	254 49.9		58.7	114 24.3	11.3	22 42.1	3.4	54.3	
06	269 50.1	N	8 57.8	128 54.6	11.3	S22 38.7	3.5	54.3	
07	284 50.3		56.9	143 24.9	11.4	22 35.2	3.6	54.3	
J 08	299 50.5		56.0	157 55.3	11.4	22 31.6	3.7	54.3	
U 09	314 50.7	. .	55.1	172 25.7	11.5	22 27.9	3.9	54.3	
E 10	329 50.9		54.2	186 56.2	11.5	22 24.0	3.9	54.3	
V 11	344 51.1		53.3	201 26.7	11.5	22 20.1	4.0	54.3	
12	359 51.2	N	8 52.4	215 57.2	11.6	S22 16.1	4.1	54.3	
E 13	14 51.4		51.5	230 27.8	11.6	22 12.0	4.3	54.3	
14	29 51.6		50.6	244 58.4	11.6	22 07.7	4.3	54.2	
S 15	44 51.8	. .	49.7	259 29.0	11.7	22 03.4	4.5	54.2	
16	59 52.0		48.8	273 59.7	11.8	21 58.9	4.5	54.2	
17	74 52.2		48.0	288 30.5	11.8	21 54.4	4.6	54.2	
18	89 52.4	N	8 47.1	303 01.3	11.8	S21 49.8	4.8	54.2	
19	104 52.6		46.2	317 32.1	11.9	21 45.0	4.8	54.2	
20	119 52.8		45.3	332 03.0	11.9	21 40.2	5.0	54.2	
21	134 53.0	. .	44.4	346 33.9	11.9	21 35.2	5.0	54.2	
22	149 53.2		43.5	1 04.8	12.0	21 30.2	5.1	54.2	
23	164 53.4		42.6	15 35.8	12.1	21 25.1	5.3	54.2	
31 00	179 53.6	N	8 41.7	30 06.9	12.1	S21 19.8	5.3	54.2	
01	194 53.8		40.8	44 38.0	12.1	21 14.5	5.4	54.1	
02	209 54.0		39.9	59 09.1	12.2	21 09.1	5.5	54.1	
03	224 54.2	. .	39.0	73 40.3	12.2	21 03.6	5.6	54.1	
04	239 54.4		38.1	88 11.5	12.3	20 58.0	5.7	54.1	
05	254 54.5		37.2	102 42.8	12.3	20 52.3	5.8	54.1	
06	269 54.7	N	8 36.3	117 14.1	12.4	S20 46.5	5.9	54.1	
07	284 54.9		35.4	131 45.5	12.4	20 40.6	6.0	54.1	
V 08	299 55.1		34.5	146 16.9	12.4	20 34.6	6.1	54.1	
I 09	314 55.3	. .	33.6	160 48.3	12.5	20 28.5	6.2	54.1	
E 10	329 55.5		32.7	175 19.8	12.6	20 22.3	6.2	54.1	
R 11	344 55.7		31.7	189 51.4	12.6	20 16.1	6.4	54.1	
N 12	359 55.9	N	8 30.8	204 23.0	12.6	S20 09.7	6.4	54.1	
E 13	14 56.1		29.9	218 54.6	12.7	20 03.3	6.5	54.1	
S 14	29 56.3		29.0	233 26.3	12.8	19 56.8	6.6	54.1	
15	44 56.5	. .	28.1	247 58.1	12.8	19 50.2	6.7	54.1	
16	59 56.7		27.2	262 29.9	12.8	19 43.5	6.8	54.0	
17	74 56.9		26.3	277 01.7	12.9	19 36.7	6.9	54.0	
18	89 57.1	N	8 25.4	291 33.6	12.9	S19 29.8	6.9	54.0	
19	104 57.3		24.5	306 05.5	13.0	19 22.9	7.1	54.0	
20	119 57.5		23.6	320 37.5	13.0	19 15.8	7.1	54.0	
21	134 57.7	. .	22.7	335 09.5	13.1	19 08.7	7.2	54.0	
22	149 57.9		21.8	349 41.6	13.1	19 01.5	7.3	54.0	
23	164 58.1		20.9	4 13.7	13.1	S18 54.2	7.4	54.0	
	SD 15.9		d 0.9	SD 14.9		14.8		14.7	

Lat.	Crepúsculo Náutico	Crepúsculo Civil	Orto Sol	Orto Luna 29	Orto Luna 30	Orto Luna 31	Orto Luna 1
°	h m	h m	h m	h m	h m	h m	h m
N 72	////	02 16	03 51	▬	▬	▬	21 30
N 70	////	02 48	04 07	▬	▬	21 32	20 51
68	01 09	03 11	04 19	▬	21 12	20 39	20 24
66	01 57	03 29	04 29	20 03	20 07	20 06	20 04
64	02 26	03 43	04 37	19 10	19 31	19 42	19 47
62	02 48	03 55	04 44	18 38	19 06	19 23	19 33
60	03 04	04 04	04 50	18 14	18 46	19 07	19 22
N 58	03 18	04 13	04 55	17 55	18 29	18 53	19 11
56	03 30	04 20	05 00	17 39	18 15	18 42	19 02
54	03 40	04 27	05 05	17 25	18 03	18 32	18 55
52	03 49	04 33	05 08	17 13	17 52	18 23	18 47
50	03 56	04 38	05 12	17 02	17 42	18 15	18 41
45	04 12	04 49	05 19	16 40	17 22	17 57	18 27
N 40	04 24	04 58	05 26	16 22	17 06	17 43	18 16
35	04 34	05 05	05 31	16 07	16 52	17 31	18 06
30	04 43	05 11	05 36	15 54	16 40	17 20	17 57
20	04 55	05 22	05 44	15 32	16 19	17 02	17 42
N 10	05 05	05 30	05 51	15 13	16 01	16 46	17 29
0	05 12	05 36	05 57	14 55	15 44	16 31	17 17
S 10	05 18	05 42	06 04	14 37	15 27	16 16	17 05
20	05 22	05 48	06 10	14 17	15 09	16 00	16 51
30	05 26	05 54	06 18	13 55	14 48	15 42	16 36
35	05 27	05 56	06 22	13 42	14 36	15 31	16 27
40	05 28	05 59	06 27	13 27	14 22	15 19	16 17
45	05 29	06 03	06 32	13 09	14 05	15 04	16 05
S 50	05 29	06 06	06 39	12 47	13 44	14 46	15 51
52	05 29	06 08	06 42	12 36	13 34	14 38	15 44
54	05 28	06 09	06 45	12 24	13 23	14 28	15 37
56	05 28	06 11	06 48	12 10	13 11	14 18	15 28
58	05 27	06 13	06 52	11 54	12 56	14 05	15 19
S 60	05 27	06 15	06 57	11 35	12 38	13 51	15 08

Lat.	Ocaso Sol	Crepúsculo Civil	Crepúsculo Náutico	Ocasc Luna 29	Ocasc Luna 30	Ocasc Luna 31	Ocasc Luna 1
°	h m	h m	h m	h m	h m	h m	h m
N 72	20 06	21 39	////	▬	▬	▬	▬
N 70	19 52	21 09	////	▬	▬	▬	00 06
68	19 40	20 47	22 41	▬	22 47	24 58	00 58
66	19 30	20 30	21 59	22 14	23 52	25 30	01 30
64	19 22	20 16	21 31	23 07	24 27	00 27	01 53
62	19 15	20 04	21 10	23 39	24 52	00 52	02 12
60	19 09	19 55	20 54	24 03	00 03	01 12	02 27
N 58	19 04	19 46	20 41	24 22	00 22	01 28	02 40
56	19 00	19 39	20 29	24 37	00 37	01 42	02 51
54	18 55	19 33	20 19	24 51	00 51	01 54	03 01
52	18 52	19 27	20 11	00 08	01 03	02 04	03 09
50	18 48	19 22	20 03	00 19	01 13	02 13	03 17
45	18 41	19 11	19 48	00 41	01 35	02 33	03 34
N 40	18 35	19 03	19 36	01 00	01 53	02 49	03 47
35	18 29	18 55	19 26	01 15	02 08	03 02	03 58
30	18 25	18 49	19 18	01 28	02 20	03 14	04 08
20	18 17	18 39	19 06	01 51	02 42	03 34	04 25
N 10	18 10	18 31	18 56	02 10	03 01	03 51	04 40
0	18 04	18 25	18 49	02 29	03 19	04 07	04 54
S 10	17 58	18 19	18 43	02 47	03 36	04 23	05 07
20	17 51	18 13	18 39	03 06	03 55	04 40	05 22
30	17 44	18 08	18 36	03 29	04 16	05 00	05 38
35	17 40	18 05	18 35	03 42	04 29	05 11	05 48
40	17 35	18 02	18 34	03 57	04 44	05 24	05 59
45	17 30	17 59	18 33	04 15	05 01	05 39	06 12
S 50	17 23	17 56	18 33	04 38	05 22	05 58	06 27
52	17 20	17 55	18 34	04 48	05 32	06 07	06 34
54	17 17	17 53	18 34	05 00	05 43	06 17	06 42
56	17 14	17 51	18 34	05 14	05 56	06 28	06 51
58	17 10	17 50	18 35	05 31	06 11	06 40	07 01
S 60	17 05	17 48	18 36	05 50	06 29	06 55	07 13

Día	SOL E.T. (−) 00h	SOL E.T. (−) 12h	SOL Pas. Mer.	LUNA Pas. Sup.	LUNA Mer. Inf.	LUNA Edad	LUNA Fase
d	m s	m s	h m	h m	h m	d	%
29	01 03	00 54	12 01	21 07	08 42	10	83
30	00 45	00 35	12 01	21 56	09 31	11	90
31	00 26	00 17	12 00	22 43	10 19	12	95

T.U.	ARIES	VENUS −4.0		MARTE −0.8		JUPITER −2.1		SATURNO +0.1	
d h	A.H.G.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.
	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
1 00	340 13.4	212 06.5	N18 49.2	74 26.3	S26 59.9	239 25.2	N22 51.2	266 58.3	N20 46.0
01	355 15.8	227 05.9	48.6	89 27.4	59.9	254 27.2	51.2	282 00.6	46.0
02	10 18.3	242 05.3	48.0	104 28.6	59.8	269 29.2	51.2	297 03.0	46.0
03	25 20.8	257 04.7 . .	47.4	119 29.8 . .	59.8	284 31.2 . .	51.1	312 05.3 . .	46.0
04	40 23.2	272 04.0	46.8	134 31.0	59.8	299 33.3	51.1	327 07.6	46.0
05	55 25.7	287 03.4	46.2	149 32.1	59.8	314 35.3	51.1	342 10.0	46.0
06	70 28.2	302 02.8	N18 45.5	164 33.3	S26 59.8	329 37.3	N22 51.0	357 12.3	N20 46.0
S 07	85 30.6	317 02.1	44.9	179 34.5	59.7	344 39.3	51.0	12 14.7	46.0
08	100 33.1	332 01.5	44.3	194 35.6	59.7	359 41.3	51.0	27 17.0	46.0
A 09	115 35.6	347 00.9 . .	43.7	209 36.8 . .	59.7	14 43.3 . .	51.0	42 19.4 . .	46.0
10	130 38.0	2 00.3	43.1	224 37.9	59.7	29 45.4	50.9	57 21.7	46.0
B 11	145 40.5	16 59.6	42.5	239 39.1	59.6	44 47.4	50.9	72 24.0	46.0
12	160 42.9	31 59.0	N18 41.9	254 40.3	S26 59.6	59 49.4	N22 50.9	87 26.4	N20 46.0
A 13	175 45.4	46 58.4	41.2	269 41.4	59.6	74 51.4	50.8	102 28.7	46.1
D 14	190 47.9	61 57.8	40.6	284 42.6	59.6	89 53.4	50.8	117 31.1	46.1
15	205 50.3	76 57.1 . .	40.0	299 43.8 . .	59.5	104 55.5 . .	50.8	132 33.4 . .	46.1
O 16	220 52.8	91 56.5	39.4	314 44.9	59.5	119 57.5	50.8	147 35.8	46.1
17	235 55.3	106 55.9	38.8	329 46.1	59.5	134 59.5	50.7	162 38.1	46.1
18	250 57.7	121 55.3	N18 38.1	344 47.2	S26 59.5	150 01.5	N22 50.7	177 40.5	N20 46.1
19	266 00.2	136 54.6	37.5	359 48.4	59.4	165 03.5	50.7	192 42.8	46.1
20	281 02.7	151 54.0	36.9	14 49.6	59.4	180 05.5	50.7	207 45.1	46.1
21	296 05.1	166 53.4 . .	36.3	29 50.7 . .	59.4	195 07.6 . .	50.6	222 47.5 . .	46.1
22	311 07.6	181 52.8	35.6	44 51.9	59.4	210 09.6	50.6	237 49.8	46.1
23	326 10.0	196 52.1	35.0	59 53.0	59.3	225 11.6	50.6	252 52.2	46.1
2 00	341 12.5	211 51.5	N18 34.4	74 54.2	S26 59.3	240 13.6	N22 50.5	267 54.5	N20 46.1
01	356 15.0	226 50.9	33.8	89 55.3	59.3	255 15.6	50.5	282 56.9	46.1
02	11 17.4	241 50.3	33.1	104 56.5	59.2	270 17.7	50.5	297 59.2	46.2
03	26 19.9	256 49.7 . .	32.5	119 57.6 . .	59.2	285 19.7 . .	50.5	313 01.6 . .	46.2
04	41 22.4	271 49.0	31.9	134 58.8	59.2	300 21.7	50.4	328 03.9	46.2
05	56 24.8	286 48.4	31.2	149 59.9	59.2	315 23.7	50.4	343 06.3	46.2
06	71 27.3	301 47.8	N18 30.6	165 01.1	S26 59.1	330 25.8	N22 50.4	358 08.6	N20 46.2
07	86 29.8	316 47.2	30.0	180 02.2	59.1	345 27.8	50.3	13 11.0	46.2
D 08	101 32.2	331 46.6	29.3	195 03.4	59.1	0 29.8	50.3	28 13.3	46.2
O 09	116 34.7	346 45.9 . .	28.7	210 04.5 . .	59.0	15 31.8 . .	50.3	43 15.6 . .	46.2
M 10	131 37.2	1 45.3	28.1	225 05.7	59.0	30 33.8	50.3	58 18.0	46.2
I 11	146 39.6	16 44.7	27.4	240 06.8	59.0	45 35.9	50.2	73 20.3	46.2
12	161 42.1	31 44.1	N18 26.8	255 08.0	S26 59.0	60 37.9	N22 50.2	88 22.7	N20 46.2
N 13	176 44.5	46 43.5	26.1	270 09.1	58.9	75 39.9	50.2	103 25.0	46.2
G 14	191 47.0	61 42.8	25.5	285 10.2	58.9	90 41.9	50.1	118 27.4	46.2
15	206 49.5	76 42.2 . .	24.9	300 11.4 . .	58.9	105 44.0 . .	50.1	133 29.7 . .	46.3
O 16	221 51.9	91 41.6	24.2	315 12.5	58.8	120 46.0	50.1	148 32.1	46.3
17	236 54.4	106 41.0	23.6	330 13.7	58.8	135 48.0	50.1	163 34.4	46.3
18	251 56.9	121 40.4	N18 22.9	345 14.8	S26 58.8	150 50.0	N22 50.0	178 36.8	N20 46.3
19	266 59.3	136 39.7	22.3	0 15.9	58.8	165 52.0	50.0	193 39.1	46.3
20	282 01.8	151 39.1	21.6	15 17.1	58.7	180 54.1	50.0	208 41.5	46.3
21	297 04.3	166 38.5 . .	21.0	30 18.2 . .	58.7	195 56.1 . .	50.0	223 43.8 . .	46.3
22	312 06.7	181 37.9	20.3	45 19.4	58.7	210 58.1	49.9	238 46.2	46.3
23	327 09.2	196 37.3	19.7	60 20.5	58.6	226 00.1	49.9	253 48.5	46.3
3 00	342 11.6	211 36.7	N18 19.0	75 21.6	S26 58.6	241 02.2	N22 49.9	268 50.9	N20 46.3
01	357 14.1	226 36.0	18.4	90 22.8	58.6	256 04.2	49.8	283 53.2	46.3
02	12 16.6	241 35.4	17.7	105 23.9	58.5	271 06.2	49.8	298 55.6	46.3
03	27 19.0	256 34.8 . .	17.1	120 25.0 . .	58.5	286 08.2 . .	49.8	313 57.9 . .	46.3
04	42 21.5	271 34.2	16.4	135 26.2	58.5	301 10.3	49.8	329 00.3	46.3
05	57 24.0	286 33.6	15.8	150 27.3	58.4	316 12.3	49.7	344 02.6	46.3
06	72 26.4	301 33.0	N18 15.1	165 28.4	S26 58.4	331 14.3	N22 49.7	359 05.0	N20 46.4
07	87 28.9	316 32.3	14.5	180 29.6	58.4	346 16.4	49.7	14 07.3	46.4
L 08	102 31.4	331 31.7	13.8	195 30.7	58.3	1 18.4	49.6	29 09.7	46.4
U 09	117 33.8	346 31.1 . .	13.2	210 31.8 . .	58.3	16 20.4 . .	49.6	44 12.0 . .	46.4
10	132 36.3	1 30.5	12.5	225 32.9	58.3	31 22.4	49.6	59 14.4	46.4
N 11	147 38.8	16 29.9	11.8	240 34.1	58.2	46 24.5	49.6	74 16.7	46.4
12	162 41.2	31 29.3	N18 11.2	255 35.2	S26 58.2	61 26.5	N22 49.5	89 19.1	N20 46.4
E 13	177 43.7	46 28.7	10.5	270 36.3	58.2	76 28.5	49.5	104 21.4	46.4
14	192 46.1	61 28.1	09.9	285 37.4	58.1	91 30.5	49.5	119 23.8	46.4
S 15	207 48.6	76 27.4 . .	09.2	300 38.6 . .	58.1	106 32.6 . .	49.4	134 26.2 . .	46.4
16	222 51.1	91 26.8	08.5	315 39.7	58.1	121 34.6	49.4	149 28.5	46.4
17	237 53.5	106 26.2	07.9	330 40.8	58.0	136 36.6	49.4	164 30.9	46.4
18	252 56.0	121 25.6	N18 07.2	345 41.9	S26 58.0	151 38.7	N22 49.4	179 33.2	N20 46.4
19	267 58.5	136 25.0	06.5	0 43.1	58.0	166 40.7	49.3	194 35.6	46.4
20	283 00.9	151 24.4	05.9	15 44.2	57.9	181 42.7	49.3	209 37.9	46.5
21	298 03.4	166 23.8 . .	05.2	30 45.3 . .	57.9	196 44.7 . .	49.3	224 40.3 . .	46.5
22	313 05.9	181 23.2	04.5	45 46.4	57.9	211 46.8	49.2	239 42.6	46.5
23	328 08.3	196 22.6	03.8	60 47.5	57.8	226 48.8	49.2	254 45.0	46.5
Pas. Mer.	h m 1 15.0	*v* −0.6	*d* 0.6	*v* 1.1	*d* 0.0	*v* 2.0	*d* 0.0	*v* 2.3	*d* 0.0

ESTRELLAS		
Nombre	A.H.S.	Dec.
	° ′	° ′
Acamar	315 25.1	S40 17.7
Achernar	335 33.1	S57 13.5
Acrux	173 20.5	S63 06.5
Adhara	255 20.0	S28 58.2
Aldebaran	291 00.0	N16 30.7
Alioth	166 29.1	N55 57.4
Alkaid	153 06.4	N49 18.7
Al Na'ir	27 54.8	S46 57.2
Alnilam	275 55.9	S 1 11.9
Alphard	218 05.5	S 8 39.7
Alphecca	126 18.9	N26 42.9
Alpheratz	357 52.8	N29 05.9
Altair	62 17.0	N 8 52.5
Ankaa	353 24.4	S42 17.7
Antares	112 37.7	S26 26.1
Arcturus	146 04.4	N19 10.7
Atria	107 47.8	S69 02.1
Avior	234 22.4	S59 30.6
Bellatrix	278 42.0	N 6 21.1
Betelgeuse	271 11.4	N 7 24.5
Canopus	264 00.5	S52 41.5
Capella	280 48.2	N45 59.8
Deneb	49 37.4	N45 17.3
Denebola	182 43.4	N14 34.0
Diphda	349 04.9	S17 58.6
Dubhe	194 03.5	N61 44.7
Elnath	278 24.4	N28 36.5
Eltanin	90 50.3	N51 29.6
Enif	33 55.9	N 9 53.0
Fomalhaut	15 33.8	S29 36.8
Gacrux	172 11.9	S57 07.3
Gienah	176 02.2	S17 32.9
Hadar	149 01.6	S60 22.9
Hamal	328 11.0	N23 28.1
Kaus Aust.	83 55.9	S34 23.1
Kochab	137 20.0	N74 09.3
Markab	13 47.3	N15 12.9
Menkar	314 24.6	N 4 05.8
Menkent	148 18.8	S36 22.6
Miaplacidus	221 42.6	S69 43.2
Mirfak	308 53.6	N49 51.8
Nunki	76 09.6	S26 17.7
Peacock	53 33.2	S56 43.9
Pollux	243 39.3	N28 01.4
Procyon	245 09.6	N 5 13.4
Rasalhague	96 15.0	N12 33.7
Regulus	207 53.7	N11 57.8
Rigel	281 21.0	S 8 11.8
Rigil Kent.	140 05.0	S60 50.6
Sabik	102 23.1	S15 43.6
Schedar	349 50.7	N56 32.6
Shaula	96 34.4	S37 06.4
Sirius	258 42.1	S16 42.9
Spica	158 41.3	S11 10.0
Suhail	222 59.7	S43 26.1
Vega	80 45.0	N38 47.4
Zuben'ubi	137 15.8	S16 02.8

	A.H.S.	Pas. Mer.
	° ′	h m
Venus	230 39.0	9 53
Marte	93 41.7	18 59
Júpiter	259 01.1	7 58
Saturno	286 42.0	6 07

T.U.	SOL				LUNA					
	A.H.G.		Dec.		A.H.G.	v	Dec.	d	P.H.	
d h	° ′		° ′		° ′	′	° ′	′	′	
1 00	179 58.3	N	8 20.0		18 45.8	13.3	S18 46.8	7.4	54.0	
01	194 58.5		19.1		33 18.1	13.2	18 39.4	7.6	54.0	
02	209 58.7		18.2		47 50.3	13.3	18 31.8	7.6	54.0	
03	224 58.9	. .	17.3		62 22.6	13.4	18 24.2	7.7	54.0	
04	239 59.1		16.4		76 55.0	13.4	18 16.5	7.7	54.0	
05	254 59.3		15.5		91 27.4	13.4	18 08.8	7.9	54.0	
06	269 59.5	N	8 14.6		105 59.8	13.5	S18 00.9	7.9	54.0	
07	284 59.7		13.7		120 32.3	13.5	17 53.0	8.0	54.0	
S 08	299 59.9		12.7		135 04.8	13.6	17 45.0	8.1	54.0	
A 09	315 00.1	. .	11.8		149 37.4	13.7	17 36.9	8.1	54.0	
B 10	330 00.3		10.9		164 10.1	13.6	17 28.8	8.2	54.0	
A 11	345 00.5		10.0		178 42.7	13.8	17 20.6	8.3	54.0	
D 12	0 00.7	N	8 09.1		193 15.5	13.7	S17 12.3	8.4	54.0	
O 13	15 00.9		08.2		207 48.2	13.8	17 03.9	8.4	54.0	
14	30 01.1		07.3		222 21.0	13.9	16 55.5	8.6	54.0	
15	45 01.3	. .	06.4		236 53.9	13.9	16 46.9	8.5	54.0	
16	60 01.5		05.5		251 26.8	13.9	16 38.4	8.7	54.0	
17	75 01.7		04.6		265 59.7	14.0	16 29.7	8.7	54.0	
18	90 01.9	N	8 03.7		280 32.7	14.1	S16 21.0	8.8	54.0	
19	105 02.1		02.8		295 05.8	14.0	16 12.2	8.9	54.0	
20	120 02.3		01.8		309 38.8	14.2	16 03.3	8.9	54.0	
21	135 02.5	. .	00.9		324 12.0	14.1	15 54.4	9.0	54.0	
22	150 02.7		8 00.0		338 45.1	14.2	15 45.4	9.1	54.0	
23	165 02.9		7 59.1		353 18.3	14.3	15 36.3	9.1	54.0	
2 00	180 03.1	N	7 58.2		7 51.6	14.3	S15 27.2	9.2	54.0	
01	195 03.3		57.3		22 24.9	14.3	15 18.0	9.2	54.0	
02	210 03.5		56.4		36 58.2	14.4	15 08.8	9.3	54.0	
03	225 03.7	. .	55.5		51 31.6	14.4	14 59.5	9.4	54.0	
04	240 03.9		54.6		66 05.0	14.5	14 50.1	9.4	54.0	
05	255 04.1		53.6		80 38.5	14.5	14 40.7	9.5	54.0	
06	270 04.3	N	7 52.7		95 12.0	14.5	S14 31.2	9.6	54.0	
07	285 04.5		51.8		109 45.5	14.6	14 21.6	9.6	54.0	
D 08	300 04.7		50.9		124 19.1	14.6	14 12.0	9.7	54.0	
O 09	315 04.9	. .	50.0		138 52.7	14.7	14 02.3	9.7	54.0	
M 10	330 05.1		49.1		153 26.4	14.7	13 52.6	9.8	54.0	
I 11	345 05.3		48.2		168 00.1	14.7	13 42.8	9.9	54.0	
N 12	0 05.5	N	7 47.3		182 33.8	14.8	S13 32.9	9.9	54.0	
G 13	15 05.7		46.3		197 07.6	14.8	13 23.0	9.9	54.0	
14	30 05.9		45.4		211 41.4	14.8	13 13.1	10.1	54.0	
O 15	45 06.1	. .	44.5		226 15.2	14.9	13 03.0	10.0	54.0	
16	60 06.3		43.6		240 49.1	14.9	12 53.0	10.2	54.0	
17	75 06.5		42.7		255 23.0	15.0	12 42.8	10.1	54.0	
18	90 06.7	N	7 41.8		269 57.0	14.9	S12 32.7	10.3	54.0	
19	105 06.9		40.9		284 30.9	15.1	12 22.4	10.2	54.0	
20	120 07.1		39.9		299 05.0	15.0	12 12.2	10.4	54.0	
21	135 07.3	. .	39.0		313 39.0	15.1	12 01.8	10.3	54.0	
22	150 07.5		38.1		328 13.1	15.1	11 51.5	10.5	54.0	
23	165 07.7		37.2		342 47.2	15.2	11 41.0	10.4	54.0	
3 00	180 07.9	N	7 36.3		357 21.4	15.1	S11 30.6	10.5	54.0	
01	195 08.1		35.4		11 55.5	15.3	11 20.1	10.6	54.0	
02	210 08.3		34.5		26 29.8	15.2	11 09.5	10.6	54.0	
03	225 08.5	. .	33.5		41 04.0	15.3	10 58.9	10.7	54.0	
04	240 08.8		32.6		55 38.3	15.3	10 48.2	10.7	54.0	
05	255 09.0		31.7		70 12.6	15.3	10 37.5	10.7	54.0	
06	270 09.2	N	7 30.8		84 46.9	15.4	S10 26.8	10.8	54.0	
07	285 09.4		29.9		99 21.3	15.3	10 16.0	10.9	54.0	
L 08	300 09.6		28.9		113 55.6	15.5	10 05.1	10.8	54.0	
09	315 09.8	. .	28.0		128 30.1	15.4	9 54.3	10.9	54.1	
U 10	330 10.0		27.1		143 04.5	15.5	9 43.4	11.0	54.1	
N 11	345 10.2		26.2		157 39.0	15.5	9 32.4	11.0	54.1	
12	0 10.4	N	7 25.3		172 13.5	15.5	S 9 21.4	11.0	54.1	
E 13	15 10.6		24.4		186 48.0	15.5	9 10.4	11.1	54.1	
14	30 10.8		23.4		201 22.5	15.6	8 59.3	11.1	54.1	
S 15	45 11.0	. .	22.5		215 57.1	15.6	8 48.2	11.2	54.1	
16	60 11.2		21.6		230 31.7	15.6	8 37.0	11.1	54.1	
17	75 11.4		20.7		245 06.3	15.6	8 25.9	11.3	54.1	
18	90 11.6	N	7 19.8		259 40.9	15.6	S 8 14.6	11.2	54.1	
19	105 11.8		18.8		274 15.5	15.7	8 03.4	11.3	54.1	
20	120 12.0		17.9		288 50.2	15.7	7 52.1	11.3	54.1	
21	135 12.2	. .	17.0		303 24.9	15.7	7 40.8	11.4	54.1	
22	150 12.5		16.1		317 59.6	15.7	7 29.4	11.4	54.1	
23	165 12.7		15.2		332 34.3	15.8	S 7 18.0	11.4	54.1	
	SD 15.9	d	0.9		SD 14.7		14.7		14.7	

Lat.	Crepúsculo Náutico	Crepúsculo Civil	Orto Sol	Orto Luna 1	Orto Luna 2	Orto Luna 3	Orto Luna 4
°	h m	h m	h m	h m	h m	h m	h m
N 72	////	02 38	04 06	21 30	20 51	20 26	20 06
N 70	////	03 05	04 19	20 51	20 30	20 15	20 02
68	01 40	03 25	04 30	20 24	20 14	20 06	19 58
66	02 16	03 40	04 38	20 04	20 01	19 58	19 55
64	02 40	03 53	04 46	19 47	19 50	19 51	19 52
62	02 59	04 03	04 52	19 33	19 40	19 46	19 50
60	03 14	04 12	04 57	19 22	19 32	19 41	19 48
N 58	03 27	04 20	05 02	19 11	19 25	19 36	19 46
56	03 38	04 27	05 06	19 02	19 19	19 32	19 45
54	03 47	04 33	05 10	18 55	19 13	19 29	19 43
52	03 55	04 38	05 13	18 47	19 08	19 26	19 42
50	04 02	04 43	05 16	18 41	19 03	19 23	19 41
45	04 16	04 53	05 23	18 27	18 53	19 16	19 38
N 40	04 28	05 01	05 29	18 16	18 45	19 11	19 36
35	04 37	05 08	05 33	18 06	18 37	19 06	19 34
30	04 44	05 13	05 37	17 57	18 31	19 02	19 32
20	04 56	05 22	05 45	17 42	18 20	18 55	19 29
N 10	05 05	05 29	05 51	17 29	18 10	18 49	19 27
0	05 11	05 35	05 56	17 17	18 01	18 43	19 24
S 10	05 16	05 41	06 02	17 05	17 51	18 37	19 22
20	05 20	05 46	06 08	16 51	17 41	18 31	19 19
30	05 22	05 50	06 14	16 36	17 30	18 23	19 16
35	05 23	05 52	06 18	16 27	17 23	18 19	19 15
40	05 23	05 55	06 22	16 17	17 16	18 14	19 13
45	05 23	05 57	06 27	16 05	17 07	18 09	19 11
S 50	05 23	06 00	06 32	15 51	16 57	18 02	19 08
52	05 22	06 01	06 35	15 44	16 52	17 59	19 07
54	05 21	06 02	06 38	15 37	16 46	17 56	19 05
56	05 21	06 03	06 41	15 28	16 40	17 52	19 04
58	05 20	06 05	06 44	15 19	16 33	17 48	19 02
S 60	05 18	06 06	06 48	15 08	16 25	17 43	19 00

Lat.	Ocaso Sol	Crepúsculo Civil	Crepúsculo Náutico	Ocaso Luna 1	Ocaso Luna 2	Ocaso Luna 3	Ocaso Luna 4
°	h m	h m	h m	h m	h m	h m	h m
N 72	19 50	21 15	////	▬	01 43	03 52	05 44
N 70	19 37	20 50	23 14	00 06	02 20	04 10	05 53
68	19 27	20 31	22 12	00 58	02 46	04 25	06 01
66	19 19	20 16	21 39	01 30	03 05	04 37	06 07
64	19 12	20 04	21 15	01 53	03 21	04 47	06 12
62	19 06	19 54	20 57	02 12	03 34	04 55	06 16
60	19 01	19 45	20 42	02 27	03 45	05 03	06 20
N 58	18 56	19 38	20 30	02 40	03 54	05 09	06 23
56	18 52	19 31	20 20	02 51	04 03	05 15	06 26
54	18 48	19 25	20 11	03 01	04 10	05 20	06 29
52	18 45	19 20	20 03	03 09	04 17	05 24	06 32
50	18 42	19 15	19 56	03 17	04 22	05 28	06 34
45	18 35	19 06	19 42	03 34	04 35	05 37	06 39
N 40	18 30	18 58	19 31	03 47	04 46	05 44	06 43
35	18 25	18 51	19 22	03 58	04 55	05 50	06 46
30	18 21	18 46	19 14	04 08	05 02	05 56	06 49
20	18 14	18 37	19 03	04 25	05 16	06 05	06 54
N 10	18 08	18 30	18 54	04 40	05 27	06 13	06 59
0	18 03	18 24	18 48	04 54	05 38	06 21	07 03
S 10	17 58	18 19	18 43	05 07	05 49	06 29	07 07
20	17 52	18 14	18 40	05 22	06 00	06 37	07 11
30	17 46	18 10	18 37	05 38	06 13	06 46	07 16
35	17 42	18 07	18 37	05 48	06 21	06 51	07 19
40	17 38	18 05	18 37	05 59	06 29	06 57	07 22
45	17 33	18 03	18 37	06 12	06 39	07 04	07 26
S 50	17 28	18 00	18 38	06 27	06 51	07 12	07 31
52	17 25	17 59	18 38	06 34	06 57	07 16	07 33
54	17 22	17 58	18 39	06 42	07 03	07 20	07 35
56	17 19	17 57	18 40	06 51	07 10	07 24	07 37
58	17 16	17 56	18 41	07 01	07 17	07 29	07 40
S 60	17 12	17 54	18 42	07 13	07 26	07 35	07 43

Dia	SOL E.T. (−)(+) 00h	SOL E.T. (−)(+) 12h	SOL Pas. Mer.	LUNA Pas. Mer. Sup.	LUNA Pas. Mer. Inf.	Edad	Fase
d	m s	m s	h m	h m	h m	d %	
1	00 07	00 02	12 00	23 28	11 05	13 98	
2	00 12	00 22	12 00	24 11	11 49	14 100	◯
3	00 31	00 41	11 59	00 11	12 32	15 100	

T.U.	ARIES	VENUS −4.0		MARTE −0.8		JUPITER −2.1		SATURNO +0.1	
	A.H.G.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
4 00	343 10.8	211 21.9	N18 03.2	75 48.7	S26 57.8	241 50.8	N22 49.2	269 47.3	N20 46.5
01	358 13.3	226 21.3	02.5	90 49.8	57.8	256 52.9	49.2	284 49.7	46.5
02	13 15.7	241 20.7	01.8	105 50.9	57.7	271 54.9	49.1	299 52.0	46.5
03	28 18.2	256 20.1 . .	01.2	120 52.0 . .	57.7	286 56.9 . .	49.1	314 54.4 . .	46.5
04	43 20.6	271 19.5	18 00.5	135 53.1	57.7	301 59.0	49.1	329 56.8	46.5
05	58 23.1	286 18.9	17 59.8	150 54.2	57.6	317 01.0	49.1	344 59.1	46.5
06	73 25.6	301 18.3	N17 59.1	165 55.3	S26 57.6	332 03.0	N22 49.0	0 01.5	N20 46.5
07	88 28.0	316 17.7	58.5	180 56.5	57.5	347 05.0	49.0	15 03.8	46.5
M 08	103 30.5	331 17.1	57.8	195 57.6	57.5	2 07.1	49.0	30 06.2	46.5
A 09	118 33.0	346 16.5 . .	57.1	210 58.7 . .	57.5	17 09.1 . .	48.9	45 08.5 . .	46.5
R 10	133 35.4	1 15.9	56.4	225 59.8	57.4	32 11.1	48.9	60 10.9	46.5
11	148 37.9	16 15.2	55.7	241 00.9	57.4	47 13.2	48.9	75 13.3	46.5
T 12	163 40.4	31 14.6	N17 55.1	256 02.0	S26 57.4	62 15.2	N22 48.9	90 15.6	N20 46.6
13	178 42.8	46 14.0	54.4	271 03.1	57.3	77 17.2	48.8	105 18.0	46.6
E 14	193 45.3	61 13.4	53.7	286 04.2	57.3	92 19.3	48.8	120 20.3	46.6
15	208 47.7	76 12.8 . .	53.0	301 05.3 . .	57.2	107 21.3 . .	48.8	135 22.7 . .	46.6
S 16	223 50.2	91 12.2	52.3	316 06.4	57.2	122 23.3	48.7	150 25.0	46.6
17	238 52.7	106 11.6	51.6	331 07.5	57.2	137 25.4	48.7	165 27.4	46.6
18	253 55.1	121 11.0	N17 50.9	346 08.6	S26 57.1	152 27.4	N22 48.7	180 29.8	N20 46.6
19	268 57.6	136 10.4	50.3	1 09.8	57.1	167 29.4	48.7	195 32.1	46.6
20	284 00.1	151 09.8	49.6	16 10.9	57.0	182 31.5	48.6	210 34.5	46.6
21	299 02.5	166 09.2 . .	48.9	31 12.0 . .	57.0	197 33.5 . .	48.6	225 36.8 . .	46.6
22	314 05.0	181 08.6	48.2	46 13.1	57.0	212 35.5	48.6	240 39.2	46.6
23	329 07.5	196 08.0	47.5	61 14.2	56.9	227 37.6	48.5	255 41.5	46.6
5 00	344 09.9	211 07.4	N17 46.8	76 15.3	S26 56.9	242 39.6	N22 48.5	270 43.9	N20 46.6
01	359 12.4	226 06.8	46.1	91 16.4	56.8	257 41.7	48.5	285 46.3	46.6
02	14 14.9	241 06.2	45.4	106 17.5	56.8	272 43.7	48.5	300 48.6	46.6
03	29 17.3	256 05.6 . .	44.7	121 18.6 . .	56.8	287 45.7 . .	48.4	315 51.0 . .	46.6
04	44 19.8	271 05.0	44.0	136 19.7	56.7	302 47.8	48.4	330 53.3	46.7
05	59 22.2	286 04.4	43.3	151 20.8	56.7	317 49.8	48.4	345 55.7	46.7
06	74 24.7	301 03.8	N17 42.6	166 21.8	S26 56.6	332 51.8	N22 48.3	0 58.1	N20 46.7
M 07	89 27.2	316 03.2	41.9	181 22.9	56.6	347 53.9	48.3	16 00.4	46.7
I 08	104 29.6	331 02.6	41.2	196 24.0	56.6	2 55.9	48.3	31 02.8	46.7
E 09	119 32.1	346 02.0 . .	40.5	211 25.1 . .	56.5	17 57.9 . .	48.3	46 05.1 . .	46.7
R 10	134 34.6	1 01.4	39.8	226 26.2	56.5	33 00.0	48.2	61 07.5	46.7
C 11	149 37.0	16 00.8	39.1	241 27.3	56.4	48 02.0	48.2	76 09.9	46.7
O 12	164 39.5	31 00.2	N17 38.4	256 28.4	S26 56.4	63 04.1	N22 48.2	91 12.2	N20 46.7
L 13	179 42.0	45 59.6	37.7	271 29.5	56.3	78 06.1	48.1	106 14.6	46.7
E 14	194 44.4	60 59.0	37.0	286 30.6	56.3	93 08.1	48.1	121 16.9	46.7
S 15	209 46.9	75 58.4 . .	36.3	301 31.7 . .	56.3	108 10.2 . .	48.1	136 19.3 . .	46.7
16	224 49.3	90 57.8	35.6	316 32.8	56.2	123 12.2	48.1	151 21.7	46.7
17	239 51.8	105 57.2	34.9	331 33.9	56.2	138 14.2	48.0	166 24.0	46.7
18	254 54.3	120 56.6	N17 34.2	346 34.9	S26 56.1	153 16.3	N22 48.0	181 26.4	N20 46.7
19	269 56.7	135 56.0	33.5	1 36.0	56.1	168 18.3	48.0	196 28.8	46.7
20	284 59.2	150 55.4	32.8	16 37.1	56.0	183 20.4	47.9	211 31.1	46.7
21	300 01.7	165 54.8 . .	32.0	31 38.2 . .	56.0	198 22.4 . .	47.9	226 33.5 . .	46.7
22	315 04.1	180 54.2	31.3	46 39.3	56.0	213 24.4	47.9	241 35.8	46.8
23	330 06.6	195 53.6	30.6	61 40.4	55.9	228 26.5	47.9	256 38.2	46.8
6 00	345 09.1	210 53.0	N17 29.9	76 41.5	S26 55.9	243 28.5	N22 47.8	271 40.6	N20 46.8
01	0 11.5	225 52.4	29.2	91 42.5	55.8	258 30.6	47.8	286 42.9	46.8
02	15 14.0	240 51.8	28.5	106 43.6	55.8	273 32.6	47.8	301 45.3	46.8
03	30 16.5	255 51.2 . .	27.8	121 44.7 . .	55.7	288 34.6 . .	47.7	316 47.7 . .	46.8
04	45 18.9	270 50.6	27.0	136 45.8	55.7	303 36.7	47.7	331 50.0	46.8
05	60 21.4	285 50.0	26.3	151 46.9	55.6	318 38.7	47.7	346 52.4	46.8
06	75 23.8	300 49.4	N17 25.6	166 47.9	S26 55.6	333 40.8	N22 47.7	1 54.8	N20 46.8
07	90 26.3	315 48.8	24.9	181 49.0	55.5	348 42.8	47.6	16 57.1	46.8
J 08	105 28.8	330 48.2	24.2	196 50.1	55.5	3 44.9	47.6	31 59.5	46.8
U 09	120 31.2	345 47.6 . .	23.4	211 51.2 . .	55.4	18 46.9 . .	47.6	47 01.9 . .	46.8
E 10	135 33.7	0 47.0	22.7	226 52.3	55.4	33 48.9	47.6	62 04.2	46.8
11	150 36.2	15 46.4	22.0	241 53.3	55.4	48 51.0	47.5	77 06.6	46.8
V 12	165 38.6	30 45.8	N17 21.3	256 54.4	S26 55.3	63 53.0	N22 47.5	92 09.0	N20 46.8
13	180 41.1	45 45.2	20.5	271 55.5	55.3	78 55.1	47.5	107 11.3	46.8
E 14	195 43.6	60 44.6	19.8	286 56.6	55.2	93 57.1	47.4	122 13.7	46.8
15	210 46.0	75 44.1 . .	19.1	301 57.6 . .	55.2	108 59.1 . .	47.4	137 16.1 . .	46.8
S 16	225 48.5	90 43.5	18.4	316 58.7	55.1	124 01.2	47.4	152 18.4	46.8
17	240 50.9	105 42.9	17.6	331 59.8	55.1	139 03.2	47.4	167 20.8	46.9
18	255 53.4	120 42.3	N17 16.9	347 00.8	S26 55.0	154 05.3	N22 47.3	182 23.2	N20 46.9
19	270 55.9	135 41.7	16.2	2 01.9	55.0	169 07.3	47.3	197 25.5	46.9
20	285 58.3	150 41.1	15.5	17 03.0	54.9	184 09.4	47.3	212 27.9	46.9
21	301 00.8	165 40.5 . .	14.7	32 04.1 . .	54.9	199 11.4 . .	47.2	227 30.3 . .	46.9
22	316 03.3	180 39.9	14.0	47 05.1	54.8	214 13.5	47.2	242 32.6	46.9
23	331 05.7	195 39.3	13.3	62 06.2	54.8	229 15.5	47.2	257 35.0	46.9
	h m								
Pas. Mer.	1 03.2	v −0.6	d 0.7	v 1.1	d 0.0	v 2.0	d 0.0	v 2.4	d 0.0

ESTRELLAS

Nombre	A.H.S.	Dec.
	° ′	° ′
Acamar	315 25.1	S40 17.7
Achernar	335 33.1	S57 13.5
Acrux	173 20.5	S63 06.5
Adhara	255 20.0	S28 58.2
Aldebaran	291 00.0	N16 30.8
Alioth	166 29.2	N55 57.4
Alkaid	153 06.4	N49 18.6
Al Na'ir	27 54.8	S46 57.2
Alnilam	275 55.8	S 1 11.9
Alphard	218 05.5	S 8 39.7
Alphecca	126 18.9	N26 42.9
Alpheratz	357 52.8	N29 05.9
Altair	62 17.0	N 8 52.5
Ankaa	353 24.4	S42 17.7
Antares	112 37.7	S26 26.1
Arcturus	146 04.4	N19 10.7
Atria	107 47.9	S69 02.1
Avior	234 22.4	S59 30.6
Bellatrix	278 42.0	N 6 21.1
Betelgeuse	271 11.4	N 7 24.5
Canopus	264 00.5	S52 41.5
Capella	280 48.2	N45 59.8
Deneb	49 37.5	N45 17.3
Denebola	182 43.4	N14 34.0
Diphda	349 04.9	S17 58.6
Dubhe	194 03.5	N61 44.7
Elnath	278 24.4	N28 36.5
Eltanin	90 50.3	N51 29.6
Enif	33 55.9	N 9 53.0
Fomalhaut	15 33.8	S29 36.8
Gacrux	172 11.9	S57 07.3
Gienah	176 02.2	S17 32.9
Hadar	149 01.6	S60 22.9
Hamal	328 11.0	N23 28.1
Kaus Aust.	83 55.9	S34 23.1
Kochab	137 20.0	N74 09.3
Markab	13 47.3	N15 12.9
Menkar	314 24.6	N 4 05.8
Menkent	148 18.8	S36 22.6
Miaplacidus	221 42.6	S69 43.2
Mirfak	308 53.5	N49 51.8
Nunki	76 09.6	S26 17.7
Peacock	53 33.2	S56 43.9
Pollux	243 39.3	N28 01.4
Procyon	245 09.6	N 5 13.4
Rasalhague	96 15.0	N12 33.7
Regulus	207 53.7	N11 57.8
Rigel	281 21.0	S 8 11.8
Rigil Kent.	140 05.0	S60 50.6
Sabik	102 23.1	S15 43.6
Schedar	349 50.7	N56 32.6
Shaula	96 34.4	S37 06.4
Sirius	258 42.1	S16 42.9
Spica	158 41.3	S11 10.0
Suhail	222 59.7	S43 26.1
Vega	80 45.1	N38 47.4
Zuben'ubi	137 15.9	S16 02.8

	A.H.S.	Pas. Mer.
	° ′	h m
Venus	226 57.5	9 56
Marte	92 05.3	18 54
Júpiter	258 29.7	7 48
Saturno	286 34.0	5 56

T.U.	SOL				LUNA						
	A.H.G.		Dec.		A.H.G.	v	Dec.	d	P.H.		
d h	°	′	°	′	°	′	°	′	′	′	
4 00	180	12.9	N 7	14.2	347	09.1	15.7	S 7	06.6	11.4	54.1
01	195	13.1		13.3	1	43.8	15.8	6	55.2	11.5	54.2
02	210	13.3		12.4	16	18.6	15.8	6	43.7	11.5	54.2
03	225	13.5	. .	11.5	30	53.4	15.8	6	32.2	11.5	54.2
04	240	13.7		10.6	45	28.2	15.8	6	20.7	11.6	54.2
05	255	13.9		09.6	60	03.0	15.8	6	09.1	11.6	54.2
06	270	14.1	N 7	08.7	74	37.8	15.9	S 5	57.5	11.6	54.2
07	285	14.3		07.8	89	12.7	15.8	5	45.9	11.6	54.2
M 08	300	14.5		06.9	103	47.5	15.9	5	34.3	11.7	54.2
09	315	14.7	. .	05.9	118	22.4	15.9	5	22.6	11.7	54.2
A 10	330	14.9		05.0	132	57.3	15.8	5	10.9	11.7	54.2
R 11	345	15.1		04.1	147	32.1	15.9	4	59.2	11.7	54.2
T 12	0	15.4	N 7	03.2	162	07.0	15.9	S 4	47.5	11.8	54.2
13	15	15.6		02.3	176	41.9	15.9	4	35.7	11.8	54.3
E 14	30	15.8		01.3	191	16.8	16.0	4	23.9	11.8	54.3
S 15	45	16.0	7	00.4	205	51.8	15.9	4	12.1	11.8	54.3
16	60	16.2	6	59.5	220	26.7	15.9	4	00.3	11.8	54.3
17	75	16.4		58.6	235	01.6	15.9	3	48.5	11.9	54.3
18	90	16.6	N 6	57.6	249	36.5	16.0	S 3	36.6	11.9	54.3
19	105	16.8		56.7	264	11.5	15.9	3	24.7	11.9	54.3
20	120	17.0		55.8	278	46.4	15.9	3	12.8	11.9	54.3
21	135	17.2	. .	54.9	293	21.3	16.0	3	00.9	11.9	54.3
22	150	17.4		53.9	307	56.3	15.9	2	49.0	11.9	54.3
23	165	17.6		53.0	322	31.2	16.0	2	37.1	12.0	54.4
5 00	180	17.9	N 6	52.1	337	06.2	15.9	S 2	25.1	12.0	54.4
01	195	18.1		51.2	351	41.1	15.9	2	13.1	12.0	54.4
02	210	18.3		50.2	6	16.0	16.0	2	01.1	12.0	54.4
03	225	18.5	. .	49.3	20	51.0	15.9	1	49.1	12.0	54.4
04	240	18.7		48.4	35	25.9	15.9	1	37.1	12.0	54.4
05	255	18.9		47.4	50	00.8	15.9	1	25.1	12.0	54.4
06	270	19.1	N 6	46.5	64	35.7	15.9	S 1	13.1	12.0	54.4
M 07	285	19.3		45.6	79	10.6	15.9	1	01.1	12.1	54.4
I 08	300	19.5		44.7	93	45.5	15.9	0	49.0	12.0	54.5
E 09	315	19.7	. .	43.7	108	20.4	15.9	0	37.0	12.1	54.5
R 10	330	19.9		42.8	122	55.3	15.9	0	24.9	12.1	54.5
C 11	345	20.2		41.9	137	30.2	15.9	0	12.8	12.1	54.5
O 12	0	20.4	N 6	41.0	152	05.1	15.8	S 0	00.7	12.0	54.5
L 13	15	20.6		40.0	166	39.9	15.9	N 0	11.3	12.1	54.5
E 14	30	20.8		39.1	181	14.8	15.8	0	23.4	12.1	54.5
S 15	45	21.0	. .	38.2	195	49.6	15.8	0	35.5	12.1	54.6
16	60	21.2		37.2	210	24.4	15.8	0	47.6	12.1	54.6
17	75	21.4		36.3	224	59.2	15.8	0	59.7	12.1	54.6
18	90	21.6	N 6	35.4	239	34.0	15.8	N 1	11.8	12.1	54.6
19	105	21.8		34.5	254	08.8	15.8	1	23.9	12.1	54.6
20	120	22.1		33.5	268	43.6	15.7	1	36.0	12.1	54.6
21	135	22.3	. .	32.6	283	18.3	15.7	1	48.1	12.1	54.6
22	150	22.5		31.7	297	53.0	15.7	2	00.2	12.1	54.6
23	165	22.7		30.7	312	27.7	15.7	2	12.3	12.1	54.7
6 00	180	22.9	N 6	29.8	327	02.4	15.7	N 2	24.4	12.0	54.7
01	195	23.1		28.9	341	37.1	15.6	2	36.4	12.1	54.7
02	210	23.3		27.9	356	11.7	15.6	2	48.5	12.1	54.7
03	225	23.5	. .	27.0	10	46.3	15.6	3	00.6	12.1	54.7
04	240	23.7		26.1	25	20.9	15.6	3	12.7	12.0	54.7
05	255	24.0		25.2	39	55.5	15.5	3	24.7	12.1	54.8
06	270	24.2	N 6	24.2	54	30.0	15.5	N 3	36.8	12.1	54.8
07	285	24.4		23.3	69	04.5	15.5	3	48.9	12.0	54.8
J 08	300	24.6		22.4	83	39.0	15.5	4	00.9	12.0	54.8
U 09	315	24.8	. .	21.4	98	13.5	15.4	4	12.9	12.1	54.8
10	330	25.0		20.5	112	47.9	15.4	4	25.0	12.0	54.8
E 11	345	25.2		19.6	127	22.3	15.4	4	37.0	12.0	54.9
V 12	0	25.4	N 6	18.6	141	56.7	15.3	N 4	49.0	12.0	54.9
13	15	25.6		17.7	156	31.0	15.3	5	01.0	11.9	54.9
E 14	30	25.9		16.8	171	05.3	15.3	5	12.9	12.0	54.9
S 15	45	26.1	. .	15.8	185	39.6	15.2	5	24.9	11.9	54.9
16	60	26.3		14.9	200	13.8	15.2	5	36.8	12.0	54.9
17	75	26.5		14.0	214	48.0	15.2	5	48.8	11.9	55.0
18	90	26.7	N 6	13.0	229	22.2	15.1	N 6	00.7	11.9	55.0
19	105	26.9		12.1	243	56.3	15.1	6	12.6	11.9	55.0
20	120	27.1		11.2	258	30.4	15.1	6	24.5	11.8	55.0
21	135	27.4	. .	10.2	273	04.5	15.0	6	36.3	11.9	55.0
22	150	27.6		09.3	287	38.5	15.0	6	48.2	11.8	55.1
23	165	27.8		08.4	302	12.5	14.9	N 7	00.0	11.8	55.1
	SD	15.9	d	0.9	SD		14.8		14.9		15.0

Lat.	Crepúsculo Náutico	Crepúsculo Civil	Orto Sol	Orto Luna 4	Orto Luna 5	Orto Luna 6	Orto Luna 7
°	h m	h m	h m	h m	h m	h m	h m
N 72	////	02 58	04 21	20 06	19 47	19 27	19 04
N 70	01 17	03 21	04 32	20 02	19 49	19 36	19 21
68	02 03	03 38	04 41	19 58	19 50	19 43	19 34
66	02 32	03 52	04 48	19 55	19 52	19 49	19 46
64	02 54	04 03	04 54	19 52	19 53	19 54	19 55
62	03 10	04 12	05 00	19 50	19 54	19 58	20 03
60	03 24	04 20	05 04	19 48	19 55	20 02	20 10
N 58	03 35	04 27	05 08	19 46	19 56	20 05	20 17
56	03 45	04 33	05 12	19 45	19 56	20 08	20 22
54	03 53	04 38	05 15	19 43	19 57	20 11	20 27
52	04 01	04 43	05 18	19 42	19 58	20 14	20 32
50	04 07	04 48	05 21	19 41	19 58	20 16	20 36
45	04 21	04 57	05 27	19 38	19 59	20 21	20 45
N 40	04 31	05 04	05 31	19 36	20 00	20 25	20 52
35	04 39	05 10	05 36	19 34	20 01	20 29	20 59
30	04 46	05 15	05 39	19 32	20 02	20 32	21 04
20	04 57	05 23	05 45	19 29	20 03	20 38	21 14
N 10	05 05	05 29	05 51	19 27	20 04	20 43	21 23
0	05 10	05 35	05 55	19 24	20 06	20 48	21 32
S 10	05 15	05 39	06 00	19 22	20 07	20 53	21 40
20	05 17	05 43	06 05	19 19	20 08	20 58	21 49
30	05 19	05 47	06 11	19 16	20 10	21 04	21 59
35	05 19	05 48	06 14	19 15	20 10	21 07	22 05
40	05 19	05 50	06 17	19 13	20 11	21 11	22 12
45	05 18	05 52	06 21	19 11	20 13	21 16	22 20
S 50	05 16	05 54	06 26	19 08	20 14	21 21	22 30
52	05 15	05 54	06 28	19 07	20 15	21 24	22 34
54	05 14	05 55	06 31	19 05	20 15	21 26	22 39
56	05 13	05 56	06 33	19 04	20 16	21 29	22 45
58	05 12	05 57	06 36	19 02	20 17	21 33	22 51
S 60	05 10	05 58	06 39	19 00	20 18	21 37	22 58

Lat.	Ocaso Sol	Crepúsculo Civil	Crepúsculo Náutico	Ocaso Luna 4	Ocaso Luna 5	Ocaso Luna 6	Ocaso Luna 7
°	h m	h m	h m	h m	h m	h m	h m
N 72	19 33	20 54	////	05 44	07 32	09 20	11 13
N 70	19 23	20 33	22 30	05 53	07 33	09 14	10 58
68	19 14	20 16	21 48	06 01	07 34	09 09	10 46
66	19 07	20 03	21 21	06 07	07 35	09 05	10 36
64	19 01	19 52	21 00	06 12	07 36	09 01	10 28
62	18 56	19 43	20 44	06 16	07 37	08 58	10 21
60	18 51	19 35	20 31	06 20	07 37	08 55	10 15
N 58	18 48	19 29	20 20	06 23	07 38	08 53	10 10
56	18 44	19 23	20 11	06 26	07 38	08 51	10 05
54	18 41	19 17	20 02	06 29	07 39	08 49	10 01
52	18 38	19 13	19 55	06 32	07 39	08 48	09 57
50	18 35	19 09	19 49	06 34	07 40	08 46	09 54
45	18 30	19 00	19 36	06 39	07 40	08 43	09 46
N 40	18 25	18 53	19 25	06 43	07 41	08 40	09 40
35	18 21	18 47	19 17	06 46	07 42	08 38	09 35
30	18 18	18 42	19 10	06 49	07 42	08 36	09 30
20	18 12	18 34	19 00	06 54	07 43	08 32	09 22
N 10	18 07	18 28	18 52	06 59	07 44	08 29	09 15
0	18 02	18 23	18 47	07 03	07 44	08 26	09 09
S 10	17 57	18 18	18 43	07 07	07 45	08 23	09 02
20	17 52	18 15	18 40	07 11	07 45	08 20	08 55
30	17 47	18 11	18 39	07 16	07 46	08 16	08 47
35	17 44	18 09	18 39	07 19	07 47	08 14	08 42
40	17 41	18 08	18 39	07 22	07 47	08 12	08 37
45	17 37	18 06	18 40	07 26	07 48	08 09	08 31
S 50	17 32	18 05	18 42	07 31	07 48	08 06	08 24
52	17 30	18 04	18 43	07 33	07 48	08 04	08 21
54	17 28	18 03	18 44	07 35	07 49	08 03	08 17
56	17 25	18 02	18 45	07 37	07 49	08 01	08 13
58	17 22	18 02	18 47	07 40	07 49	07 59	08 09
S 60	17 19	18 01	18 49	07 43	07 50	07 57	08 04

Día	SOL E.T. (+) 00h	SOL E.T. (+) 12h	SOL Pas. Mer.	LUNA Pas. Mer. Sup.	LUNA Pas. Mer. Inf.	LUNA Edad	LUNA Fase
d	m s	m s	h m	h m	h m	d	%
4	00 51	01 01	11 59	00 53	13 14	16	98
5	01 11	01 21	11 59	01 34	13 55	17	94
6	01 31	01 41	11 58	02 16	14 37	18	88

T.U.	ARIES	VENUS −4.0		MARTE −0.7		JUPITER −2.1		SATURNO +0.1	
	A.H.G.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
7 00	346 08.2	210 38.7	N17 12.5	77 07.3	S26 54.7	244 17.5	N22 47.2	272 37.4	N20 46.9
01	1 10.7	225 38.1	11.8	92 08.3	54.7	259 19.6	47.1	287 39.7	46.9
02	16 13.1	240 37.6	11.0	107 09.4	54.6	274 21.6	47.1	302 42.1	46.9
03	31 15.6	255 37.0 . .	10.3	122 10.5 . .	54.6	289 23.7 . .	47.1	317 44.5 . .	46.9
04	46 18.1	270 36.4	09.6	137 11.5	54.5	304 25.7	47.0	332 46.8	46.9
05	61 20.5	285 35.8	08.8	152 12.6	54.5	319 27.8	47.0	347 49.2	46.9
06	76 23.0	300 35.2	N17 08.1	167 13.6	S26 54.4	334 29.8	N22 47.0	2 51.6	N20 46.9
07	91 25.4	315 34.6	07.4	182 14.7	54.4	349 31.9	47.0	17 53.9	46.9
V 08	106 27.9	330 34.0	06.6	197 15.8	54.3	4 33.9	46.9	32 56.3	46.9
I 09	121 30.4	345 33.4 . .	05.9	212 16.8 . .	54.3	19 36.0 . .	46.9	47 58.7 . .	46.9
E 10	136 32.8	0 32.8	05.1	227 17.9	54.2	34 38.0	46.9	63 01.0	46.9
R 11	151 35.3	15 32.3	04.4	242 18.9	54.1	49 40.1	46.8	78 03.4	46.9
N 12	166 37.8	30 31.7	N17 03.6	257 20.0	S26 54.1	64 42.1	N22 46.8	93 05.8	N20 46.9
E 13	181 40.2	45 31.1	02.9	272 21.1	54.0	79 44.2	46.8	108 08.2	46.9
S 14	196 42.7	60 30.5	02.1	287 22.1	54.0	94 46.2	46.8	123 10.5	47.0
15	211 45.2	75 29.9 . .	01.4	302 23.2 . .	53.9	109 48.3 . .	46.7	138 12.9 . .	47.0
16	226 47.6	90 29.3	17 00.7	317 24.2	53.9	124 50.3	46.7	153 15.3	47.0
17	241 50.1	105 28.7	16 59.9	332 25.3	53.8	139 52.4	46.7	168 17.6	47.0
18	256 52.5	120 28.2	N16 59.2	347 26.3	S26 53.8	154 54.4	N22 46.6	183 20.0	N20 47.0
19	271 55.0	135 27.6	58.4	2 27.4	53.7	169 56.5	46.6	198 22.4	47.0
20	286 57.5	150 27.0	57.7	17 28.5	53.7	184 58.5	46.6	213 24.8	47.0
21	301 59.9	165 26.4 . .	56.9	32 29.5 . .	53.6	200 00.6 . .	46.6	228 27.1 . .	47.0
22	317 02.4	180 25.8	56.1	47 30.6	53.6	215 02.6	46.5	243 29.5	47.0
23	332 04.9	195 25.2	55.4	62 31.6	53.5	230 04.7	46.5	258 31.9	47.0
8 00	347 07.3	210 24.7	N16 54.6	77 32.7	S26 53.4	245 06.7	N22 46.5	273 34.2	N20 47.0
01	2 09.8	225 24.1	53.9	92 33.7	53.4	260 08.8	46.4	288 36.6	47.0
02	17 12.3	240 23.5	53.1	107 34.8	53.3	275 10.8	46.4	303 39.0	47.0
03	32 14.7	255 22.9 . .	52.4	122 35.8 . .	53.3	290 12.9 . .	46.4	318 41.4 . .	47.0
04	47 17.2	270 22.3	51.6	137 36.9	53.2	305 14.9	46.4	333 43.7	47.0
05	62 19.7	285 21.7	50.9	152 37.9	53.2	320 17.0	46.3	348 46.1	47.0
06	77 22.1	300 21.2	N16 50.1	167 39.0	S26 53.1	335 19.0	N22 46.3	3 48.5	N20 47.0
07	92 24.6	315 20.6	49.3	182 40.0	53.1	350 21.1	46.3	18 50.9	47.0
S 08	107 27.0	330 20.0	48.6	197 41.0	53.0	5 23.1	46.2	33 53.2	47.0
A 09	122 29.5	345 19.4 . .	47.8	212 42.1 . .	52.9	20 25.2 . .	46.2	48 55.6 . .	47.0
B 10	137 32.0	0 18.8	47.0	227 43.1	52.9	35 27.2	46.2	63 58.0	47.0
A 11	152 34.4	15 18.3	46.3	242 44.2	52.8	50 29.3	46.2	79 00.4	47.0
D 12	167 36.9	30 17.7	N16 45.5	257 45.2	S26 52.8	65 31.3	N22 46.1	94 02.7	N20 47.0
O 13	182 39.4	45 17.1	44.7	272 46.3	52.7	80 33.4	46.1	109 05.1	47.1
14	197 41.8	60 16.5	44.0	287 47.3	52.6	95 35.4	46.1	124 07.5	47.1
15	212 44.3	75 15.9 . .	43.2	302 48.3 . .	52.6	110 37.5 . .	46.0	139 09.9 . .	47.1
16	227 46.8	90 15.4	42.4	317 49.4	52.5	125 39.5	46.0	154 12.2	47.1
17	242 49.2	105 14.8	41.7	332 50.4	52.5	140 41.6	46.0	169 14.6	47.1
18	257 51.7	120 14.2	N16 40.9	347 51.5	S26 52.4	155 43.7	N22 46.0	184 17.0	N20 47.1
19	272 54.2	135 13.6	40.1	2 52.5	52.4	170 45.7	45.9	199 19.4	47.1
20	287 56.6	150 13.1	39.4	17 53.5	52.3	185 47.8	45.9	214 21.7	47.1
21	302 59.1	165 12.5 . .	38.6	32 54.6 . .	52.2	200 49.8 . .	45.9	229 24.1 . .	47.1
22	318 01.5	180 11.9	37.8	47 55.6	52.2	215 51.9	45.8	244 26.5	47.1
23	333 04.0	195 11.3	37.0	62 56.6	52.1	230 53.9	45.8	259 28.9	47.1
9 00	348 06.5	210 10.7	N16 36.3	77 57.7	S26 52.1	245 56.0	N22 45.8	274 31.2	N20 47.1
01	3 08.9	225 10.2	35.5	92 58.7	52.0	260 58.0	45.8	289 33.6	47.1
02	18 11.4	240 09.6	34.7	107 59.8	51.9	276 00.1	45.7	304 36.0	47.1
03	33 13.9	255 09.0 . .	33.9	123 00.8 . .	51.9	291 02.2 . .	45.7	319 38.4 . .	47.1
04	48 16.3	270 08.4	33.2	138 01.8	51.8	306 04.2	45.7	334 40.8	47.1
05	63 18.8	285 07.9	32.4	153 02.9	51.7	321 06.3	45.6	349 43.1	47.1
06	78 21.3	300 07.3	N16 31.6	168 03.9	S26 51.7	336 08.3	N22 45.6	4 45.5	N20 47.1
07	93 23.7	315 06.7	30.8	183 04.9	51.6	351 10.4	45.6	19 47.9	47.1
D 08	108 26.2	330 06.1	30.0	198 05.9	51.6	6 12.4	45.6	34 50.3	47.1
O 09	123 28.6	345 05.6 . .	29.3	213 07.0 . .	51.5	21 14.5 . .	45.5	49 52.6 . .	47.1
M 10	138 31.1	0 05.0	28.5	228 08.0	51.4	36 16.6	45.5	64 55.0	47.1
I 11	153 33.6	15 04.4	27.7	243 09.0	51.4	51 18.6	45.5	79 57.4	47.1
N 12	168 36.0	30 03.9	N16 26.9	258 10.1	S26 51.3	66 20.7	N22 45.4	94 59.8	N20 47.1
G 13	183 38.5	45 03.3	26.1	273 11.1	51.2	81 22.7	45.4	110 02.2	47.1
14	198 41.0	60 02.7	25.3	288 12.1	51.2	96 24.8	45.4	125 04.5	47.1
O 15	213 43.4	75 02.1 . .	24.6	303 13.1 . .	51.1	111 26.9 . .	45.4	140 06.9 . .	47.2
16	228 45.9	90 01.6	23.8	318 14.2	51.1	126 28.9	45.3	155 09.3	47.2
17	243 48.4	105 01.0	23.0	333 15.2	51.0	141 31.0	45.3	170 11.7	47.2
18	258 50.8	120 00.4	N16 22.2	348 16.2	S26 50.9	156 33.0	N22 45.3	185 14.1	N20 47.2
19	273 53.3	134 59.9	21.4	3 17.2	50.9	171 35.1	45.2	200 16.4	47.2
20	288 55.8	149 59.3	20.6	18 18.3	50.8	186 37.2	45.2	215 18.8	47.2
21	303 58.2	164 58.7 . .	19.8	33 19.3 . .	50.7	201 39.2 . .	45.2	230 21.2 . .	47.2
22	319 00.7	179 58.1	19.0	48 20.3	50.7	216 41.3	45.2	245 23.6	47.2
23	334 03.1	194 57.6	18.2	63 21.3	50.6	231 43.3	45.1	260 26.0	47.2
Pas. Mer.	h m 0 51.4	v −0.6	d 0.8	v 1.0	d 0.1	v 2.1	d 0.0	v 2.4	d 0.0

ESTRELLAS

Nombre	A.H.S.	Dec.
	° ′	° ′
Acamar	315 25.1	S40 17.7
Achernar	335 33.1	S57 13.6
Acrux	173 20.5	S63 06.4
Adhara	255 20.0	S28 58.2
Aldebaran	291 00.0	N16 30.8
Alioth	166 29.2	N55 57.3
Alkaid	153 06.5	N49 18.6
Al Na'ir	27 54.8	S46 57.2
Alnilam	275 55.8	S 1 11.9
Alphard	218 05.5	S 8 39.7
Alphecca	126 19.0	N26 42.9
Alpheratz	357 52.8	N29 05.9
Altair	62 17.1	N 8 52.5
Ankaa	353 24.3	S42 17.8
Antares	112 37.7	S26 26.1
Arcturus	146 04.4	N19 10.7
Atria	107 47.9	S69 02.1
Avior	234 22.4	S59 30.6
Bellatrix	278 42.0	N 6 21.1
Betelgeuse	271 11.4	N 7 24.5
Canopus	264 00.5	S52 41.5
Capella	280 48.2	N45 59.8
Deneb	49 37.5	N45 17.3
Denebola	182 43.4	N14 34.0
Diphda	349 04.8	S17 58.6
Dubhe	194 03.5	N61 44.7
Elnath	278 24.4	N28 36.5
Eltanin	90 50.3	N51 29.6
Enif	33 55.9	N 9 53.0
Fomalhaut	15 33.8	S29 36.8
Gacrux	172 11.9	S57 07.3
Gienah	176 02.2	S17 32.9
Hadar	149 01.7	S60 22.9
Hamal	328 11.0	N23 28.2
Kaus Aust.	83 55.9	S34 23.1
Kochab	137 20.1	N74 09.3
Markab	13 47.3	N15 12.9
Menkar	314 24.6	N 4 05.3
Menkent	148 18.8	S36 22.6
Miaplacidus	221 42.6	S69 43.2
Mirfak	308 53.5	N49 51.8
Nunki	76 09.6	S26 17.7
Peacock	53 33.3	S56 43.9
Pollux	243 39.3	N28 01.4
Procyon	245 09.6	N 5 13.4
Rasalhague	96 15.0	N12 33.7
Regulus	207 53.7	N11 57.7
Rigel	281 21.0	S 8 11.8
Rigil Kent.	140 05.0	S60 50.6
Sabik	102 23.2	S15 43.5
Schedar	349 50.7	N56 32.6
Shaula	96 34.4	S37 06.4
Sirius	258 42.1	S16 42.9
Spica	158 41.3	S11 10.0
Suhail	222 59.7	S43 26.1
Vega	80 45.1	N38 47.4
Zuben'ubi	137 15.9	S16 02.8

	A.H.S.	Pas. Mer.
	° ′	h m
Venus	223 17.3	9 59
Marte	90 25.3	18 49
Júpiter	257 59.4	7 39
Saturno	286 26.9	5 45

T.U.	SOL				LUNA					
	A.H.G.		Dec.		A.H.G.	v	Dec.	d	P.H.	
d h	°	′	°	′	°	′	°	′	′	′
7 00	180	28.0	N 6	07.4	316	46.4 14.9	N 7	11.8	11.8	55.1
01	195	28.2		06.5	331	20.3 14.9	7	23.6	11.7	55.1
02	210	28.4		05.6	345	54.2 14.8	7	35.3	11.8	55.1
03	225	28.6	. .	04.6	0	28.0 14.7	7	47.1	11.7	55.1
04	240	28.8		03.7	15	01.7 14.7	7	58.8	11.6	55.2
05	255	29.1		02.8	29	35.4 14.7	8	10.4	11.7	55.2
06	270	29.3	N 6	01.8	44	09.1 14.6	N 8	22.1	11.6	55.2
07	285	29.5	6	00.9	58	42.7 14.6	8	33.7	11.6	55.2
V 08	300	29.7	5	59.9	73	16.3 14.5	8	45.3	11.6	55.2
I 09	315	29.9	. .	59.0	87	49.8 14.5	8	56.9	11.5	55.3
E 10	330	30.1		58.1	102	23.3 14.4	9	08.4	11.6	55.3
R 11	345	30.3		57.1	116	56.7 14.4	9	20.0	11.4	55.3
N 12	0	30.6	N 5	56.2	131	30.1 14.3	N 9	31.4	11.5	55.3
E 13	15	30.8		55.3	146	03.4 14.2	9	42.9	11.4	55.4
S 14	30	31.0		54.3	160	36.6 14.3	9	54.3	11.4	55.4
15	45	31.2	. .	53.4	175	09.9 14.1	10	05.7	11.3	55.4
16	60	31.4		52.4	189	43.0 14.1	10	17.0	11.4	55.4
17	75	31.6		51.5	204	16.1 14.0	10	28.4	11.2	55.4
18	90	31.8	N 5	50.6	218	49.1 14.0	N10	39.6	11.3	55.5
19	105	32.1		49.6	233	22.1 13.9	10	50.9	11.2	55.5
20	120	32.3		48.7	247	55.0 13.9	11	02.1	11.1	55.5
21	135	32.5	. .	47.8	262	27.9 13.8	11	13.2	11.1	55.5
22	150	32.7		46.8	277	00.7 13.8	11	24.3	11.1	55.6
23	165	32.9		45.9	291	33.5 13.6	11	35.4	11.1	55.6
8 00	180	33.1	N 5	44.9	306	06.1 13.7	N11	46.5	11.0	55.6
01	195	33.3		44.0	320	38.8 13.5	11	57.5	10.9	55.6
02	210	33.6		43.1	335	11.3 13.5	12	08.4	10.9	55.7
03	225	33.8	. .	42.1	349	43.8 13.4	12	19.3	10.9	55.7
04	240	34.0		41.2	4	16.2 13.4	12	30.2	10.8	55.7
05	255	34.2		40.2	18	48.6 13.3	12	41.0	10.8	55.7
06	270	34.4	N 5	39.3	33	20.9 13.2	N12	51.8	10.7	55.7
S 07	285	34.6		38.4	47	53.1 13.1	13	02.5	10.6	55.8
A 08	300	34.9		37.4	62	25.2 13.1	13	13.1	10.7	55.8
09	315	35.1	. .	36.5	76	57.3 13.0	13	23.8	10.5	55.8
B 10	330	35.3		35.5	91	29.3 13.0	13	34.3	10.5	55.9
A 11	345	35.5		34.6	106	01.3 12.9	13	44.8	10.5	55.9
D 12	0	35.7	N 5	33.7	120	33.2 12.8	N13	55.3	10.4	55.9
O 13	15	35.9		32.7	135	05.0 12.7	14	05.7	10.4	55.9
14	30	36.1		31.8	149	36.7 12.6	14	16.1	10.3	56.0
15	45	36.4	. .	30.8	164	08.3 12.6	14	26.4	10.2	56.0
16	60	36.6		29.9	178	39.9 12.5	14	36.6	10.2	56.0
17	75	36.8		29.0	193	11.4 12.5	14	46.8	10.1	56.0
18	90	37.0	N 5	28.0	207	42.9 12.3	N14	56.9	10.0	56.1
19	105	37.2		27.1	222	14.2 12.3	15	06.9	10.0	56.1
20	120	37.4		26.1	236	45.5 12.2	15	16.9	10.0	56.1
21	135	37.7	. .	25.2	251	16.7 12.1	15	26.9	9.8	56.1
22	150	37.9		24.2	265	47.8 12.0	15	36.7	9.8	56.2
23	165	38.1		23.3	280	18.8 12.0	15	46.5	9.8	56.2
9 00	180	38.3	N 5	22.4	294	49.8 11.9	N15	56.3	9.6	56.2
01	195	38.5		21.4	309	20.7 11.8	16	05.9	9.6	56.3
02	210	38.7		20.5	323	51.5 11.7	16	15.5	9.6	56.3
03	225	39.0	. .	19.5	338	22.2 11.6	16	25.1	9.4	56.3
04	240	39.2		18.6	352	52.8 11.6	16	34.5	9.4	56.3
05	255	39.4		17.6	7	23.4 11.4	16	43.9	9.3	56.4
06	270	39.6	N 5	16.7	21	53.8 11.4	N16	53.2	9.3	56.4
07	285	39.8		15.8	36	24.2 11.3	17	02.5	9.2	56.4
D 08	300	40.0		14.8	50	54.5 11.2	17	11.7	9.1	56.5
O 09	315	40.3	. .	13.9	65	24.7 11.2	17	20.8	9.0	56.5
M 10	330	40.5		12.9	79	54.9 11.0	17	29.8	8.9	56.5
I 11	345	40.7		12.0	94	24.9 11.0	17	38.7	8.9	56.5
N 12	0	40.9	N 5	11.0	108	54.9 10.8	N17	47.6	8.7	56.6
G 13	15	41.1		10.1	123	24.7 10.8	17	56.3	8.7	56.6
O 14	30	41.3		09.1	137	54.5 10.7	18	05.0	8.7	56.6
15	45	41.6	. .	08.2	152	24.2 10.6	18	13.7	8.5	56.7
16	60	41.8		07.3	166	53.8 10.5	18	22.2	8.4	56.7
17	75	42.0		06.3	181	23.3 10.5	18	30.6	8.4	56.7
18	90	42.2	N 5	05.4	195	52.8 10.3	N18	39.0	8.3	56.8
19	105	42.4		04.4	210	22.1 10.2	18	47.3	8.1	56.8
20	120	42.7		03.5	224	51.3 10.2	18	55.4	8.1	56.8
21	135	42.9	. .	02.5	239	20.5 10.1	19	03.5	8.0	56.9
22	150	43.1		01.6	253	49.6 10.0	19	11.5	7.9	56.9
23	165	43.3		00.6	268	18.6 9.8	N19	19.4	7.8	56.9
	SD	15.9	d	0.9	SD	15.1		15.2		15.4

Lat.	Crepúsculo Náutico	Crepúsculo Civil	Orto Sol	Orto Luna 7	Orto Luna 8	Orto Luna 9	Orto Luna 10
°	h m	h m	h m	h m	h m	h m	h m
N 72	00 37	03 16	04 35	19 04	18 30	▭	▭
N 70	01 48	03 36	04 44	19 21	19 01	18 27	▭
68	02 23	03 51	04 52	19 34	19 25	19 12	18 43
66	02 47	04 03	04 58	19 46	19 43	19 41	19 41
64	03 06	04 12	05 03	19 55	19 58	20 04	20 15
62	03 21	04 21	05 07	20 03	20 11	20 22	20 40
60	03 33	04 28	05 11	20 10	20 21	20 37	21 00
N 58	03 43	04 34	05 15	20 17	20 31	20 49	21 16
56	03 52	04 39	05 18	20 22	20 39	21 00	21 30
54	04 00	04 44	05 21	20 27	20 46	21 10	21 42
52	04 06	04 48	05 23	20 32	20 53	21 19	21 53
50	04 12	04 52	05 25	20 36	20 59	21 27	22 03
45	04 25	05 00	05 30	20 45	21 12	21 44	22 23
N 40	04 34	05 07	05 34	20 52	21 22	21 57	22 39
35	04 42	05 12	05 38	20 59	21 32	22 09	22 53
30	04 48	05 17	05 41	21 04	21 40	22 19	23 05
20	04 58	05 24	05 46	21 14	21 54	22 37	23 26
N 10	05 05	05 29	05 50	21 23	22 06	22 53	23 44
0	05 09	05 34	05 54	21 32	22 18	23 08	24 01
S 10	05 13	05 37	05 58	21 40	22 30	23 22	24 18
20	05 15	05 40	06 02	21 49	22 42	23 38	24 36
30	05 15	05 43	06 07	21 59	22 57	23 56	24 58
35	05 15	05 44	06 10	22 05	23 05	24 07	00 07
40	05 14	05 45	06 12	22 12	23 15	24 19	00 19
45	05 12	05 46	06 16	22 20	23 26	24 34	00 34
S 50	05 10	05 47	06 20	22 30	23 40	24 52	00 52
52	05 09	05 48	06 21	22 34	23 47	25 00	01 00
54	05 07	05 48	06 23	22 39	23 54	25 10	01 10
56	05 05	05 48	06 25	22 45	24 02	00 02	01 20
58	05 03	05 49	06 28	22 51	24 11	00 11	01 33
S 60	05 01	05 49	06 30	22 58	24 22	00 22	01 47

Lat.	Ocaso Sol	Crepúsculo Civil	Crepúsculo Náutico	Ocaso Luna 7	Ocaso Luna 8	Ocaso Luna 9	Ocaso Luna 10
°	h m	h m	h m	h m	h m	h m	h m
N 72	19 17	20 34	22 58	11 13	13 22	▭	▭
N 70	19 09	20 16	22 00	10 58	12 52	15 07	▭
68	19 01	20 02	21 27	10 46	12 30	14 24	16 41
66	18 56	19 50	21 04	10 36	12 13	13 55	15 44
64	18 50	19 41	20 46	10 28	11 59	13 33	15 10
62	18 46	19 33	20 32	10 21	11 47	13 16	14 46
60	18 42	19 26	20 20	10 15	11 37	13 02	14 26
N 58	18 39	19 20	20 10	10 10	11 29	12 49	14 10
56	18 36	19 14	20 01	10 05	11 21	12 39	13 57
54	18 34	19 10	19 54	10 01	11 15	12 30	13 45
52	18 31	19 06	19 47	09 57	11 09	12 22	13 35
50	18 29	19 02	19 42	09 54	11 03	12 14	13 25
45	18 24	18 54	19 29	09 46	10 52	11 58	13 06
N 40	18 20	18 48	19 20	09 40	10 42	11 46	12 50
35	18 17	18 43	19 13	09 35	10 34	11 35	12 37
30	18 14	18 38	19 06	09 30	10 27	11 25	12 25
20	18 09	18 31	18 57	09 22	10 14	11 09	12 06
N 10	18 05	18 26	18 50	09 15	10 03	10 54	11 49
0	18 01	18 22	18 46	09 09	09 53	10 41	11 33
S 10	17 57	18 18	18 43	09 02	09 43	10 28	11 17
20	17 53	18 15	18 41	08 55	09 33	10 14	11 00
30	17 49	18 13	18 40	08 47	09 21	09 58	10 40
35	17 46	18 12	18 41	08 42	09 14	09 48	10 29
40	17 43	18 11	18 42	08 37	09 06	09 38	10 16
45	17 40	18 10	18 44	08 31	08 56	09 25	10 00
S 50	17 37	18 09	18 46	08 24	08 45	09 10	09 42
52	17 35	18 09	18 48	08 21	08 40	09 03	09 33
54	17 33	18 08	18 49	08 17	08 34	08 55	09 23
56	17 31	18 08	18 51	08 13	08 28	08 47	09 12
58	17 29	18 08	18 53	08 09	08 21	08 37	08 59
S 60	17 26	18 08	18 56	08 04	08 13	08 26	08 44

Día	SOL E.T. (+) 00h	SOL E.T. (+) 12h	SOL Pas. Mer.	LUNA Pas. Mer. Sup.	LUNA Mer. Inf.	LUNA Edad	LUNA Fase
d	m s	m s	h m	h m	h m	d %	
7	01 52	02 02	11 58	02 58	15 20	19 81	
8	02 12	02 22	11 58	03 42	16 06	20 73	◑
9	02 33	02 43	11 57	04 29	16 54	21 64	

T.U.	ARIES	VENUS −4.0		MARTE −0.7		JUPITER −2.1		SATURNO +0.0	
	A.H.G.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
10 00	349 05.6	209 57.0	N16 17.4	78 22.3	S26 50.5	246 45.4	N22 45.1	275 28.4	N20 47.2
01	4 08.1	224 56.4	16.6	93 23.4	50.5	261 47.5	45.1	290 30.7	47.2
02	19 10.5	239 55.9	15.8	108 24.4	50.4	276 49.5	45.0	305 33.1	47.2
03	34 13.0	254 55.3	. . 15.0	123 25.4	. . 50.3	291 51.6	. . 45.0	320 35.5	. . 47.2
04	49 15.5	269 54.7	14.2	138 26.4	50.3	306 53.6	45.0	335 37.9	47.2
05	64 17.9	284 54.2	13.4	153 27.4	50.2	321 55.7	45.0	350 40.3	47.2
06	79 20.4	299 53.6	N16 12.6	168 28.4	S26 50.1	336 57.8	N22 44.9	5 42.6	N20 47.2
07	94 22.9	314 53.0	11.8	183 29.5	50.1	351 59.8	44.9	20 45.0	47.2
08	109 25.3	329 52.5	11.0	198 30.5	50.0	7 01.9	44.9	35 47.4	47.2
L 09	124 27.8	344 51.9	. . 10.2	213 31.5	. . 49.9	22 04.0	. . 44.8	50 49.8	. . 47.2
U 10	139 30.3	359 51.3	09.4	228 32.5	49.9	37 06.0	44.8	65 52.2	47.2
11	154 32.7	14 50.8	08.6	243 33.5	49.8	52 08.1	44.8	80 54.6	47.2
N 12	169 35.2	29 50.2	N16 07.8	258 34.5	S26 49.7	67 10.2	N22 44.8	95 56.9	N20 47.2
E 13	184 37.6	44 49.6	07.0	273 35.5	49.6	82 12.2	44.7	110 59.3	47.2
14	199 40.1	59 49.1	06.2	288 36.5	49.6	97 14.3	44.7	126 01.7	47.2
S 15	214 42.6	74 48.5	. . 05.4	303 37.6	. . 49.5	112 16.3	. . 44.7	141 04.1	. . 47.2
16	229 45.0	89 47.9	04.6	318 38.6	49.4	127 18.4	44.6	156 06.5	47.2
17	244 47.5	104 47.4	03.8	333 39.6	49.4	142 20.5	44.6	171 08.9	47.2
18	259 50.0	119 46.8	N16 03.0	348 40.6	S26 49.3	157 22.5	N22 44.6	186 11.3	N20 47.2
19	274 52.4	134 46.3	02.2	3 41.6	49.2	172 24.6	44.6	201 13.6	47.2
20	289 54.9	149 45.7	01.4	18 42.6	49.2	187 26.7	44.5	216 16.0	47.2
21	304 57.4	164 45.1	16 00.6	33 43.6	. . 49.1	202 28.7	. . 44.5	231 18.4	. . 47.2
22	319 59.8	179 44.6	15 59.7	48 44.6	49.0	217 30.8	44.5	246 20.8	47.3
23	335 02.3	194 44.0	58.9	63 45.6	48.9	232 32.9	44.4	261 23.2	47.3
11 00	350 04.8	209 43.4	N15 58.1	78 46.6	S26 48.9	247 34.9	N22 44.4	276 25.6	N20 47.3
01	5 07.2	224 42.9	57.3	93 47.6	48.8	262 37.0	44.4	291 28.0	47.3
02	20 09.7	239 42.3	56.5	108 48.6	48.7	277 39.1	44.4	306 30.3	47.3
03	35 12.1	254 41.8	. . 55.7	123 49.6	. . 48.7	292 41.1	. . 44.3	321 32.7	. . 47.3
04	50 14.6	269 41.2	54.9	138 50.6	48.6	307 43.2	44.3	336 35.1	47.3
05	65 17.1	284 40.6	54.0	153 51.6	48.5	322 45.3	44.3	351 37.5	47.3
06	80 19.5	299 40.1	N15 53.2	168 52.6	S26 48.4	337 47.3	N22 44.2	6 39.9	N20 47.3
07	95 22.0	314 39.5	52.4	183 53.6	48.4	352 49.4	44.2	21 42.3	47.3
M 08	110 24.5	329 39.0	51.6	198 54.6	48.3	7 51.5	44.2	36 44.7	47.3
A 09	125 26.9	344 38.4	. . 50.8	213 55.6	. . 48.2	22 53.6	. . 44.2	51 47.1	. . 47.3
10	140 29.4	359 37.8	49.9	228 56.6	48.1	37 55.6	44.1	66 49.4	47.3
R 11	155 31.9	14 37.3	49.1	243 57.6	48.1	52 57.7	44.1	81 51.8	47.3
T 12	170 34.3	29 36.7	N15 48.3	258 58.6	S26 48.0	67 59.8	N22 44.1	96 54.2	N20 47.3
13	185 36.8	44 36.2	47.5	273 59.6	47.9	83 01.8	44.0	111 56.6	47.3
E 14	200 39.2	59 35.6	46.6	289 00.6	47.8	98 03.9	44.0	126 59.0	47.3
S 15	215 41.7	74 35.0	. . 45.8	304 01.6	. . 47.8	113 06.0	. . 44.0	142 01.4	. . 47.3
16	230 44.2	89 34.5	45.0	319 02.6	47.7	128 08.0	44.0	157 03.8	47.3
17	245 46.6	104 33.9	44.2	334 03.6	47.6	143 10.1	43.9	172 06.2	47.3
18	260 49.1	119 33.4	N15 43.3	349 04.6	S26 47.5	158 12.2	N22 43.9	187 08.6	N20 47.3
19	275 51.6	134 32.8	42.5	4 05.6	47.5	173 14.3	43.9	202 10.9	47.3
20	290 54.0	149 32.3	41.7	19 06.6	47.4	188 16.3	43.9	217 13.3	47.3
21	305 56.5	164 31.7	. . 40.9	34 07.6	. . 47.3	203 18.4	. . 43.8	232 15.7	. . 47.3
22	320 59.0	179 31.2	40.0	49 08.6	47.2	218 20.5	43.8	247 18.1	47.3
23	336 01.4	194 30.6	39.2	64 09.6	47.2	233 22.5	43.8	262 20.5	47.3
12 00	351 03.9	209 30.0	N15 38.4	79 10.6	S26 47.1	248 24.6	N22 43.7	277 22.9	N20 47.3
01	6 06.4	224 29.5	37.5	94 11.5	47.0	263 26.7	43.7	292 25.3	47.3
02	21 08.8	239 28.9	36.7	109 12.5	46.9	278 28.8	43.7	307 27.7	47.3
03	36 11.3	254 28.4	. . 35.9	124 13.5	. . 46.8	293 30.8	. . 43.7	322 30.1	. . 47.3
04	51 13.7	269 27.8	35.0	139 14.5	46.8	308 32.9	43.6	337 32.5	47.3
05	66 16.2	284 27.3	34.2	154 15.5	46.7	323 35.0	43.6	352 34.9	47.3
06	81 18.7	299 26.7	N15 33.3	169 16.5	S26 46.6	338 37.1	N22 43.6	7 37.3	N20 47.3
M 07	96 21.1	314 26.2	32.5	184 17.5	46.5	353 39.1	43.5	22 39.6	47.3
I 08	111 23.6	329 25.6	31.7	199 18.5	46.5	8 41.2	43.5	37 42.0	47.3
E 09	126 26.1	344 25.1	. . 30.8	214 19.4	. . 46.4	23 43.3	. . 43.5	52 44.4	. . 47.3
R 10	141 28.5	359 24.5	30.0	229 20.4	46.3	38 45.4	43.5	67 46.8	47.3
C 11	156 31.0	14 24.0	29.1	244 21.4	46.2	53 47.4	43.4	82 49.2	47.3
O 12	171 33.5	29 23.4	N15 28.3	259 22.4	S26 46.1	68 49.5	N22 43.4	97 51.6	N20 47.3
L 13	186 35.9	44 22.9	27.5	274 23.4	46.1	83 51.6	43.4	112 54.0	47.3
E 14	201 38.4	59 22.3	26.6	289 24.4	46.0	98 53.7	43.3	127 56.4	47.3
S 15	216 40.9	74 21.8	. . 25.8	304 25.3	. . 45.9	113 55.7	. . 43.3	142 58.8	. . 47.4
16	231 43.3	89 21.2	24.9	319 26.3	45.8	128 57.8	43.3	158 01.2	47.4
17	246 45.8	104 20.7	24.1	334 27.3	45.7	143 59.9	43.3	173 03.6	47.4
18	261 48.2	119 20.1	N15 23.2	349 28.3	S26 45.6	159 02.0	N22 43.2	188 06.0	N20 47.4
19	276 50.7	134 19.6	22.4	4 29.3	45.6	174 04.0	43.2	203 08.4	47.4
20	291 53.2	149 19.0	21.5	19 30.2	45.5	189 06.1	43.2	218 10.8	47.4
21	306 55.6	164 18.5	. . 20.7	34 31.2	. . 45.4	204 08.2	. . 43.1	233 13.2	. . 47.4
22	321 58.1	179 17.9	19.8	49 32.2	45.3	219 10.3	43.1	248 15.6	47.4
23	337 00.6	194 17.4	19.0	64 33.2	45.2	234 12.4	43.1	263 18.0	47.4
	h m								
Pas. Mer.	0 39.6	v −0.6	d 0.8	v 1.0	d 0.1	v 2.1	d 0.0	v 2.4	d 0.0

ESTRELLAS

Nombre	A.H.S.	Dec.
	° ′	° ′
Acamar	315 25.1	S40 17.7
Achernar	335 33.1	S57 13.6
Acrux	173 20.5	S63 06.4
Adhara	255 20.0	S28 58.2
Aldebaran	291 00.0	N16 30.8
Alioth	166 29.2	N55 57.3
Alkaid	153 06.5	N49 18.6
Al Na'ir	27 54.8	S46 57.2
Alnilam	275 55.8	S 1 11.9
Alphard	218 05.5	S 8 39.7
Alphecca	126 19.0	N26 42.9
Alpheratz	357 52.8	N29 06.0
Altair	62 17.1	N 8 52.5
Ankaa	353 24.3	S42 17.8
Antares	112 37.7	S26 26.1
Arcturus	146 04.4	N19 10.7
Atria	107 48.0	S69 02.0
Avior	234 22.3	S59 30.6
Bellatrix	278 42.0	N 6 21.1
Betelgeuse	271 11.4	N 7 24.5
Canopus	264 00.4	S52 41.5
Capella	280 48.2	N45 59.8
Deneb	49 37.5	N45 17.3
Denebola	182 43.4	N14 34.0
Diphda	349 04.8	S17 58.6
Dubhe	194 03.5	N61 44.7
Elnath	278 24.4	N28 36.5
Eltanin	90 50.3	N51 29.7
Enif	33 55.9	N 9 53.0
Fomalhaut	15 33.8	S29 36.8
Gacrux	172 11.9	S57 07.3
Gienah	176 02.2	S17 32.9
Hadar	149 01.7	S60 22.9
Hamal	328 11.0	N23 28.2
Kaus Aust.	83 56.0	S34 23.1
Kochab	137 20.1	N74 09.3
Markab	13 47.2	N15 12.9
Menkar	314 24.6	N 4 05.8
Menkent	148 18.8	S36 22.6
Miaplacidus	221 42.6	S69 43.2
Mirfak	308 53.5	N49 51.8
Nunki	76 09.6	S26 17.7
Peacock	53 33.3	S56 43.9
Pollux	243 39.2	N28 01.4
Procyon	245 09.6	N 5 13.4
Rasalhague	96 15.0	N12 33.7
Regulus	207 53.6	N11 57.7
Rigel	281 21.0	S 8 11.8
Rigil Kent.	140 05.0	S60 50.6
Sabik	102 23.2	S15 43.5
Schedar	349 50.7	N56 32.7
Shaula	96 34.5	S37 06.4
Sirius	258 42.0	S16 42.9
Spica	158 41.3	S11 10.0
Suhail	222 59.7	S43 26.1
Vega	80 45.1	N38 47.4
Zuben'ubi	137 15.9	S16 02.8

	A.H.S.	Pas. Mer.
	° ′	h m
Venus	219 38.7	10 01
Marte	88 41.9	18 44
Júpiter	257 30.2	7 29
Saturno	286 20.8	5 33

T.U.	SOL				LUNA					
	A.H.G.		Dec.		A.H.G.	v	Dec.	d	P.H.	
d h	°	′	°	′	°	′	′	°	′	′	′
10 00	180	43.5	N 4	59.7	282	47.4	9.8	N19	27.2	7.8	56.9
01	195	43.7		58.7	297	16.2	9.8	19	35.0	7.6	57.0
02	210	44.0		57.8	311	45.0	9.6	19	42.6	7.5	57.0
03	225	44.2	. .	56.9	326	13.6	9.5	19	50.1	7.4	57.0
04	240	44.4		55.9	340	42.1	9.4	19	57.5	7.4	57.1
05	255	44.6		55.0	355	10.5	9.4	20	04.9	7.2	57.1
06	270	44.8	N 4	54.0	9	38.9	9.2	N20	12.1	7.1	57.1
07	285	45.1		53.1	24	07.1	9.2	20	19.2	7.1	57.2
L 08	300	45.3		52.1	38	35.3	9.1	20	26.3	6.9	57.2
09	315	45.5	. .	51.2	53	03.4	9.0	20	33.2	6.8	57.2
U 10	330	45.7		50.2	67	31.4	8.8	20	40.0	6.7	57.3
11	345	45.9		49.3	81	59.2	8.8	20	46.7	6.6	57.3
N 12	0	46.1	N 4	48.3	96	27.0	8.8	N20	53.3	6.5	57.3
E 13	15	46.4		47.4	110	54.8	8.6	20	59.8	6.4	57.4
14	30	46.6		46.4	125	22.4	8.5	21	06.2	6.2	57.4
S 15	45	46.8	. .	45.5	139	49.9	8.4	21	12.4	6.2	57.4
16	60	47.0		44.5	154	17.3	8.4	21	18.6	6.0	57.5
17	75	47.2		43.6	168	44.7	8.2	21	24.6	6.0	57.5
18	90	47.5	N 4	42.6	183	11.9	8.2	N21	30.6	5.8	57.5
19	105	47.7		41.7	197	39.1	8.1	21	36.4	5.7	57.6
20	120	47.9		40.7	212	06.2	8.0	21	42.1	5.5	57.6
21	135	48.1	. .	39.8	226	33.2	7.9	21	47.6	5.5	57.6
22	150	48.3		38.8	241	00.1	7.8	21	53.1	5.3	57.7
23	165	48.6		37.9	255	26.9	7.7	21	58.4	5.2	57.7
11 00	180	48.8	N 4	36.9	269	53.6	7.7	N22	03.6	5.1	57.8
01	195	49.0		36.0	284	20.3	7.5	22	08.7	5.0	57.8
02	210	49.2		35.0	298	46.8	7.5	22	13.7	4.8	57.8
03	225	49.4	. .	34.1	313	13.3	7.4	22	18.5	4.7	57.9
04	240	49.6		33.1	327	39.7	7.3	22	23.2	4.6	57.9
05	255	49.9		32.2	342	06.0	7.2	22	27.8	4.5	57.9
06	270	50.1	N 4	31.2	356	32.2	7.1	N22	32.3	4.3	58.0
07	285	50.3		30.3	10	58.3	7.1	22	36.6	4.2	58.0
M 08	300	50.5		29.3	25	24.4	7.0	22	40.8	4.0	58.0
A 09	315	50.7	. .	28.4	39	50.4	6.9	22	44.8	4.0	58.1
R 10	330	51.0		27.4	54	16.3	6.8	22	48.8	3.7	58.1
11	345	51.2		26.5	68	42.1	6.7	22	52.5	3.7	58.1
T 12	0	51.4	N 4	25.5	83	07.8	6.6	N22	56.2	3.5	58.2
13	15	51.6		24.6	97	33.4	6.6	22	59.7	3.4	58.2
E 14	30	51.8		23.6	111	59.0	6.5	23	03.1	3.2	58.2
15	45	52.1	. .	22.7	126	24.5	6.4	23	06.3	3.1	58.3
S 16	60	52.3		21.7	140	49.9	6.4	23	09.4	3.0	58.3
17	75	52.5		20.8	155	15.3	6.3	23	12.4	2.8	58.4
18	90	52.7	N 4	19.8	169	40.6	6.2	N23	15.2	2.7	58.4
19	105	52.9		18.9	184	05.8	6.1	23	17.9	2.5	58.4
20	120	53.2		17.9	198	30.9	6.0	23	20.4	2.4	58.5
21	135	53.4	. .	17.0	212	55.9	6.0	23	22.8	2.3	58.5
22	150	53.6		16.0	227	20.9	6.0	23	25.1	2.1	58.5
23	165	53.8		15.0	241	45.9	5.8	23	27.2	1.9	58.6
12 00	180	54.0	N 4	14.1	256	10.7	5.8	N23	29.1	1.8	58.6
01	195	54.3		13.1	270	35.5	5.7	23	30.9	1.7	58.6
02	210	54.5		12.2	285	00.2	5.7	23	32.6	1.5	58.7
03	225	54.7	. .	11.2	299	24.9	5.6	23	34.1	1.3	58.7
04	240	54.9		10.3	313	49.5	5.6	23	35.4	1.2	58.7
05	255	55.1		09.3	328	14.1	5.4	23	36.6	1.0	58.8
06	270	55.4	N 4	08.4	342	38.5	5.5	N23	37.6	0.9	58.8
M 07	285	55.6		07.4	357	03.0	5.4	23	38.5	0.8	58.9
I 08	300	55.8		06.5	11	27.4	5.3	23	39.3	0.6	58.9
E 09	315	56.0	. .	05.5	25	51.7	5.2	23	39.9	0.4	58.9
R 10	330	56.2		04.6	40	15.9	5.3	23	40.3	0.3	59.0
11	345	56.5		03.6	54	40.2	5.1	23	40.6	0.1	59.0
C 12	0	56.7	N 4	02.6	69	04.3	5.1	N23	40.7	0.1	59.0
O 13	15	56.9		01.7	83	28.4	5.1	23	40.6	0.2	59.1
L 14	30	57.1	4	00.7	97	52.5	5.0	23	40.4	0.3	59.1
E 15	45	57.3	3	59.8	112	16.5	5.0	23	40.1	0.5	59.1
S 16	60	57.6		58.8	126	40.5	5.0	23	39.6	0.7	59.2
17	75	57.8		57.9	141	04.5	4.9	23	38.9	0.9	59.2
18	90	58.0	N 3	56.9	155	28.4	4.8	N23	38.0	1.0	59.2
19	105	58.2		56.0	169	52.2	4.9	23	37.0	1.1	59.3
20	120	58.4		55.0	184	16.1	4.7	23	35.9	1.3	59.3
21	135	58.7	. .	54.0	198	39.8	4.8	23	34.6	1.5	59.3
22	150	58.9		53.1	213	03.6	4.7	23	33.1	1.7	59.4
23	165	59.1		52.1	227	27.3	4.7	N23	31.4	1.8	59.4
	SD	15.9	d	1.0	SD	15.6		15.9			16.1

Lat.	Crepúsculo Náutico	Crepúsculo Civil	Orto Sol	Orto Luna 10	Orto Luna 11	Orto Luna 12	Orto Luna 13
°	h m	h m	h m	h m	h m	h m	h m
N 72	01 28	03 34	04 49	▭	▭	▭	▭
N 70	02 12	03 50	04 56	▭	▭	▭	▭
68	02 41	04 03	05 02	18 43	▭	▭	▭
66	03 01	04 13	05 07	19 41	19 49	20 37	22 28
64	03 18	04 22	05 12	20 15	20 41	21 37	23 07
62	03 31	04 29	05 15	20 40	21 13	22 10	23 34
60	03 42	04 35	05 18	21 00	21 37	22 35	23 56
N 58	03 51	04 41	05 21	21 16	21 57	22 55	24 13
56	03 59	04 46	05 24	21 30	22 13	23 11	24 27
54	04 06	04 50	05 26	21 42	22 26	23 25	24 40
52	04 12	04 54	05 28	21 53	22 38	23 38	24 51
50	04 18	04 57	05 30	22 03	22 49	23 49	25 00
45	04 29	05 04	05 34	22 23	23 11	24 11	00 11
N 40	04 37	05 10	05 37	22 39	23 30	24 29	00 29
35	04 44	05 14	05 40	22 53	23 45	24 44	00 44
30	04 50	05 18	05 42	23 05	23 58	24 58	00 58
20	04 59	05 24	05 47	23 26	24 20	00 20	01 20
N 10	05 04	05 29	05 50	23 44	24 40	00 40	01 40
0	05 09	05 33	05 53	24 01	00 01	00 58	01 58
S 10	05 11	05 35	05 56	24 18	00 18	01 17	02 16
20	05 12	05 38	06 00	24 36	00 36	01 36	02 36
30	05 12	05 39	06 03	24 58	00 58	01 59	02 58
35	05 11	05 40	06 05	00 07	01 10	02 12	03 12
40	05 09	05 41	06 08	00 19	01 24	02 28	03 27
45	05 07	05 41	06 10	00 34	01 41	02 46	03 45
S 50	05 04	05 41	06 13	00 52	02 03	03 09	04 08
52	05 02	05 41	06 14	01 00	02 13	03 20	04 18
54	05 00	05 41	06 16	01 10	02 24	03 33	04 31
56	04 58	05 41	06 18	01 20	02 37	03 47	04 45
58	04 55	05 40	06 19	01 33	02 52	04 04	05 01
S 60	04 52	05 40	06 21	01 47	03 11	04 24	05 20

Lat.	Ocaso Sol	Crepúsculo Civil	Crepúsculo Náutico	Ocaso Luna 10	Ocaso Luna 11	Ocaso Luna 12	Ocaso Luna 13
°	h m	h m	h m	h m	h m	h m	h m
N 72	19 01	20 16	22 15	▭	▭	▭	▭
N 70	18 54	20 00	21 35	▭	▭	▭	▭
68	18 49	19 48	21 08	16 41	▭	▭	▭
66	18 44	19 38	20 48	15 44	17 33	18 49	19 06
64	18 40	19 29	20 32	15 10	16 41	17 50	18 26
62	18 36	19 22	20 20	14 46	16 09	17 16	17 58
60	18 33	19 16	20 09	14 26	15 45	16 51	17 37
N 58	18 31	19 11	20 00	14 10	15 26	16 31	17 19
56	18 28	19 06	19 52	13 57	15 10	16 14	17 05
54	18 26	19 02	19 46	13 45	14 57	16 00	16 52
52	18 24	18 58	19 40	13 35	14 45	15 48	16 41
50	18 22	18 55	19 34	13 25	14 34	15 37	16 30
45	18 19	18 48	19 23	13 06	14 12	15 14	16 09
N 40	18 15	18 43	19 15	12 50	13 55	14 56	15 52
35	18 13	18 38	19 08	12 37	13 40	14 41	15 38
30	18 10	18 34	19 03	12 25	13 27	14 27	15 25
20	18 06	18 28	18 54	12 06	13 05	14 05	15 04
N 10	18 03	18 24	18 48	11 49	12 46	13 45	14 45
0	18 00	18 21	18 45	11 33	12 28	13 27	14 27
S 10	17 57	18 18	18 42	11 17	12 10	13 08	14 09
20	17 54	18 16	18 41	11 00	11 51	12 48	13 50
30	17 50	18 14	18 42	10 40	11 29	12 25	13 28
35	17 48	18 14	18 43	10 29	11 16	12 12	13 15
40	17 46	18 13	18 45	10 16	11 01	11 56	13 00
45	17 44	18 13	18 47	10 00	10 44	11 38	12 43
S 50	17 41	18 13	18 51	09 42	10 22	11 15	12 20
52	17 40	18 13	18 53	09 33	10 12	11 04	12 10
54	17 38	18 14	18 55	09 23	10 00	10 51	11 58
56	17 37	18 14	18 57	09 12	09 47	10 37	11 44
58	17 35	18 14	19 00	08 59	09 31	10 20	11 28
S 60	17 33	18 15	19 03	08 44	09 13	09 59	11 09

Día	SOL E.T. (+) 00h	SOL E.T. (+) 12h	SOL Pas. Mer.	LUNA Pas. Sup.	LUNA Mer. Inf.	LUNA Edad	LUNA Fase
d	m s	m s	h m	h m	h m	d	%
10	02 54	03 04	11 57	05 20	17 47	22	53
11	03 15	03 25	11 57	06 14	18 43	23	42
12	03 36	03 46	11 56	07 12	19 42	24	32

(JUE., VIE., SAB.) 13, 14, 15 SEPTIEMBRE DEL 2001

T.U.	ARIES	VENUS −4.0		MARTE −0.6		JUPITER −2.1		SATURNO +0.0	
d h	A.H.G.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.
	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
13 00	352 03.0	209 16.8	N15 18.1	79 34.1	S26 45.1	249 14.4	N22 43.1	278 20.3	N20 47.4
01	7 05.5	224 16.3	17.3	94 35.1	45.1	264 16.5	43.0	293 22.7	47.4
02	22 08.0	239 15.7	16.4	109 36.1	45.0	279 18.6	43.0	308 25.1	47.4
03	37 10.4	254 15.2 . .	15.6	124 37.1 . .	44.9	294 20.7 . .	43.0	323 27.5 . .	47.4
04	52 12.9	269 14.6	14.7	139 38.0	44.8	309 22.7	42.9	338 29.9	47.4
05	67 15.4	284 14.1	13.9	154 39.0	44.7	324 24.8	42.9	353 32.3	47.4
06	82 17.8	299 13.6	N15 13.0	169 40.0	S26 44.6	339 26.9	N22 42.9	8 34.7	N20 47.4
07	97 20.3	314 13.0	12.2	184 41.0	44.6	354 29.0	42.9	23 37.1	47.4
J 08	112 22.7	329 12.5	11.3	199 41.9	44.5	9 31.1	42.8	38 39.5	47.4
U 09	127 25.2	344 11.9 . .	10.4	214 42.9 . .	44.4	24 33.1 . .	42.8	53 41.9 . .	47.4
E 10	142 27.7	359 11.4	09.6	229 43.9	44.3	39 35.2	42.8	68 44.3	47.4
V 11	157 30.1	14 10.8	08.7	244 44.8	44.2	54 37.3	42.7	83 46.7	47.4
E 12	172 32.6	29 10.3	N15 07.9	259 45.8	S26 44.1	69 39.4	N22 42.7	98 49.1	N20 47.4
13	187 35.1	44 09.7	07.0	274 46.8	44.0	84 41.5	42.7	113 51.5	47.4
S 14	202 37.5	59 09.2	06.1	289 47.7	44.0	99 43.5	42.7	128 53.9	47.4
15	217 40.0	74 08.7 . .	05.3	304 48.7 . .	43.9	114 45.6 . .	42.6	143 56.3 . .	47.4
16	232 42.5	89 08.1	04.4	319 49.7	43.8	129 47.7	42.6	158 58.7	47.4
17	247 44.9	104 07.6	03.6	334 50.6	43.7	144 49.8	42.6	174 01.1	47.4
18	262 47.4	119 07.0	N15 02.7	349 51.6	S26 43.6	159 51.9	N22 42.5	189 03.5	N20 47.4
19	277 49.8	134 06.5	01.8	4 52.6	43.5	174 54.0	42.5	204 05.9	47.4
20	292 52.3	149 06.0	01.0	19 53.5	43.4	189 56.0	42.5	219 08.3	47.4
21	307 54.8	164 05.4	15 00.1	34 54.5 . .	43.3	204 58.1 . .	42.5	234 10.7 . .	47.4
22	322 57.2	179 04.9	14 59.2	49 55.5	43.3	220 00.2	42.4	249 13.1	47.4
23	337 59.7	194 04.3	58.4	64 56.4	43.2	235 02.3	42.4	264 15.5	47.4
14 00	353 02.2	209 03.8	N14 57.5	79 57.4	S26 43.1	250 04.4	N22 42.4	279 17.9	N20 47.4
01	8 04.6	224 03.3	56.6	94 58.3	43.0	265 06.5	42.4	294 20.3	47.4
02	23 07.1	239 02.7	55.7	109 59.3	42.9	280 08.5	42.3	309 22.7	47.4
03	38 09.6	254 02.2 . .	54.9	125 00.3 . .	42.8	295 10.6 . .	42.3	324 25.1 . .	47.4
04	53 12.0	269 01.6	54.0	140 01.2	42.7	310 12.7	42.3	339 27.5	47.4
05	68 14.5	284 01.1	53.1	155 02.2	42.6	325 14.8	42.2	354 29.9	47.4
06	83 17.0	299 00.6	N14 52.3	170 03.1	S26 42.5	340 16.9	N22 42.2	9 32.3	N20 47.4
07	98 19.4	314 00.0	51.4	185 04.1	42.4	355 19.0	42.2	24 34.7	47.4
V 08	113 21.9	328 59.5	50.5	200 05.1	42.3	10 21.1	42.2	39 37.1	47.4
I 09	128 24.3	343 58.9 . .	49.6	215 06.0 . .	42.3	25 23.1 . .	42.1	54 39.5 . .	47.4
E 10	143 26.8	358 58.4	48.8	230 07.0	42.2	40 25.2	42.1	69 41.9	47.4
R 11	158 29.3	13 57.9	47.9	245 07.9	42.1	55 27.3	42.1	84 44.3	47.4
N 12	173 31.7	28 57.3	N14 47.0	260 08.9	S26 42.0	70 29.4	N22 42.0	99 46.7	N20 47.4
13	188 34.2	43 56.8	46.1	275 09.8	41.9	85 31.5	42.0	114 49.1	47.4
E 14	203 36.7	58 56.3	45.2	290 10.8	41.8	100 33.6	42.0	129 51.5	47.4
S 15	218 39.1	73 55.7 . .	44.4	305 11.7 . .	41.7	115 35.7 . .	42.0	144 53.9 . .	47.4
16	233 41.6	88 55.2	43.5	320 12.7	41.6	130 37.8	41.9	159 56.3	47.4
17	248 44.1	103 54.7	42.6	335 13.6	41.5	145 39.8	41.9	174 58.7	47.4
18	263 46.5	118 54.1	N14 41.7	350 14.6	S26 41.4	160 41.9	N22 41.9	190 01.1	N20 47.4
19	278 49.0	133 53.6	40.8	5 15.5	41.3	175 44.0	41.8	205 03.6	47.4
20	293 51.5	148 53.1	40.0	20 16.5	41.2	190 46.1	41.8	220 06.0	47.4
21	308 53.9	163 52.5 . .	39.1	35 17.4 . .	41.1	205 48.2 . .	41.8	235 08.4 . .	47.4
22	323 56.4	178 52.0	38.2	50 18.4	41.0	220 50.3	41.8	250 10.8	47.4
23	338 58.8	193 51.5	37.3	65 19.3	40.9	235 52.4	41.7	265 13.2	47.4
15 00	354 01.3	208 50.9	N14 36.4	80 20.3	S26 40.8	250 54.5	N22 41.7	280 15.6	N20 47.4
01	9 03.8	223 50.4	35.5	95 21.2	40.8	265 56.6	41.7	295 18.0	47.4
02	24 06.2	238 49.9	34.6	110 22.2	40.7	280 58.7	41.7	310 20.4	47.4
03	39 08.7	253 49.3 . .	33.7	125 23.1 . .	40.6	296 00.7 . .	41.6	325 22.8 . .	47.4
04	54 11.2	268 48.8	32.9	140 24.1	40.5	311 02.8	41.6	340 25.2	47.4
05	69 13.6	283 48.3	32.0	155 25.0	40.4	326 04.9	41.6	355 27.6	47.4
06	84 16.1	298 47.7	N14 31.1	170 26.0	S26 40.3	341 07.0	N22 41.5	10 30.0	N20 47.4
S 07	99 18.6	313 47.2	30.2	185 26.9	40.2	356 09.1	41.5	25 32.4	47.4
08	114 21.0	328 46.7	29.3	200 27.9	40.1	11 11.2	41.5	40 34.8	47.4
A 09	129 23.5	343 46.2 . .	28.4	215 28.8 . .	40.0	26 13.3 . .	41.5	55 37.2 . .	47.4
10	144 26.0	358 45.6	27.5	230 29.7	39.9	41 15.4	41.4	70 39.6	47.4
B 11	159 28.4	13 45.1	26.6	245 30.7	39.8	56 17.5	41.4	85 42.0	47.4
A 12	174 30.9	28 44.6	N14 25.7	260 31.6	S26 39.7	71 19.6	N22 41.4	100 44.5	N20 47.4
13	189 33.3	43 44.0	24.8	275 32.6	39.6	86 21.7	41.3	115 46.9	47.4
D 14	204 35.8	58 43.5	23.9	290 33.5	39.5	101 23.8	41.3	130 49.3	47.4
15	219 38.3	73 43.0 . .	23.0	305 34.4 . .	39.4	116 25.8 . .	41.3	145 51.7 . .	47.4
O 16	234 40.7	88 42.5	22.1	320 35.4	39.3	131 27.9	41.3	160 54.1	47.4
17	249 43.2	103 41.9	21.2	335 36.3	39.2	146 30.0	41.2	175 56.5	47.4
18	264 45.7	118 41.4	N14 20.3	350 37.3	S26 39.1	161 32.1	N22 41.2	190 58.9	N20 47.4
19	279 48.1	133 40.9	19.4	5 38.2	39.0	176 34.2	41.2	206 01.3	47.4
20	294 50.6	148 40.4	18.5	20 39.1	38.9	191 36.3	41.1	221 03.7	47.4
21	309 53.1	163 39.8 . .	17.6	35 40.1 . .	38.8	206 38.4 . .	41.1	236 06.1 . .	47.4
22	324 55.5	178 39.3	16.7	50 41.0	38.7	221 40.5	41.1	251 08.5	47.4
23	339 58.0	193 38.8	15.8	65 41.9	38.6	236 42.6	41.1	266 11.0	47.4
	h m								
Pas. Mer.	0 27.8	v −0.5	d 0.9	v 1.0	d 0.1	v 2.1	d 0.0	v 2.4	d 0.0

ESTRELLAS

Nombre	A.H.S.	Dec.
	° ′	° ′
Acamar	315 25.0	S40 17.7
Achernar	335 33.0	S57 13.6
Acrux	173 20.5	S63 06.4
Adhara	255 19.9	S28 58.2
Aldebaran	290 59.9	N16 30.8
Alioth	166 29.2	N55 57.3
Alkaid	153 06.5	N49 18.6
Al Na'ir	27 54.8	S46 57.2
Alnilam	275 55.8	S 1 11.9
Alphard	218 05.5	S 8 39.7
Alphecca	126 19.0	N26 42.8
Alpheratz	357 52.8	N29 06.0
Altair	62 17.1	N 8 52.5
Ankaa	353 24.3	S42 17.8
Antares	112 37.7	S26 26.1
Arcturus	146 04.4	N19 10.7
Atria	107 48.0	S69 02.0
Avior	234 22.3	S59 30.6
Bellatrix	278 41.9	N 6 21.2
Betelgeuse	271 11.3	N 7 24.5
Canopus	264 00.4	S52 41.5
Capella	280 48.1	N45 59.8
Deneb	49 37.5	N45 17.4
Denebola	182 43.4	N14 34.0
Diphda	349 04.8	S17 58.6
Dubhe	194 03.5	N61 44.6
Elnath	278 24.3	N28 36.5
Eltanin	90 50.4	N51 29.7
Enif	33 55.9	N 9 53.0
Fomalhaut	15 33.7	S29 36.8
Gacrux	172 11.9	S57 07.3
Gienah	176 02.2	S17 32.9
Hadar	149 01.7	S60 22.9
Hamal	328 11.0	N23 28.2
Kaus Aust.	83 56.0	S34 23.1
Kochab	137 20.2	N74 09.3
Markab	13 47.2	N15 12.9
Menkar	314 24.5	N 4 05.8
Menkent	148 18.9	S36 22.6
Miaplacidus	221 42.6	S69 43.2
Mirfak	308 53.4	N49 51.8
Nunki	76 09.6	S26 17.7
Peacock	53 33.3	S56 44.0
Pollux	243 39.2	N28 01.4
Procyon	245 09.6	N 5 13.4
Rasalhague	96 15.0	N12 33.7
Regulus	207 53.6	N11 57.7
Rigel	281 20.9	S 8 11.8
Rigil Kent.	140 05.0	S60 50.6
Sabik	102 23.2	S15 43.5
Schedar	349 50.7	N56 32.7
Shaula	96 34.5	S37 06.4
Sirius	258 42.0	S16 42.9
Spica	158 41.3	S11 10.0
Suhail	222 59.7	S43 26.1
Vega	80 45.1	N38 47.4
Zuben'ubi	137 15.9	S16 02.8

	A.H.S.	Pas. Mer.
	° ′	h m
Venus	216 01.6	10 04
Marte	86 55.2	18 39
Júpiter	257 02.2	7 19
Saturno	286 15.7	5 22

T.U.	SOL				LUNA					
	A.H.G.		Dec.		A.H.G.	v	Dec.	d	P.H.	
d h	°	′	°	′	°	′	′	°	′	′	′
13 00	180	59.3	N 3	51.2	241	51.0	4.7	N23	29.6	1.9	59.4
01	195	59.6		50.2	256	14.7	4.6	23	27.7	2.2	59.5
02	210	59.8		49.3	270	38.3	4.6	23	25.5	2.3	59.5
03	226	00.0	. .	48.3	285	01.9	4.6	23	23.2	2.4	59.5
04	241	00.2		47.3	299	25.5	4.6	23	20.8	2.6	59.6
05	256	00.4		46.4	313	49.1	4.6	23	18.2	2.8	59.6
06	271	00.7	N 3	45.4	328	12.7	4.5	N23	15.4	3.0	59.6
07	286	00.9		44.5	342	36.2	4.5	23	12.4	3.1	59.7
J 08	301	01.1		43.5	356	59.7	4.5	23	09.3	3.2	59.7
U 09	316	01.3	. .	42.6	11	23.2	4.5	23	06.1	3.5	59.7
E 10	331	01.5		41.6	25	46.7	4.5	23	02.6	3.6	59.8
11	346	01.8		40.6	40	10.2	4.5	22	59.0	3.7	59.8
V 12	1	02.0	N 3	39.7	54	33.7	4.4	N22	55.3	4.0	59.8
13	16	02.2		38.7	68	57.1	4.5	22	51.3	4.0	59.9
E 14	31	02.4		37.8	83	20.6	4.4	22	47.3	4.3	59.9
15	46	02.6	. .	36.8	97	44.0	4.5	22	43.0	4.4	59.9
S 16	61	02.9		35.9	112	07.5	4.5	22	38.6	4.6	60.0
17	76	03.1		34.9	126	31.0	4.4	22	34.0	4.7	60.0
18	91	03.3	N 3	33.9	140	54.4	4.5	N22	29.3	4.9	60.0
19	106	03.5		33.0	155	17.9	4.4	22	24.4	5.1	60.1
20	121	03.8		32.0	169	41.3	4.5	22	19.3	5.2	60.1
21	136	04.0	. .	31.1	184	04.8	4.5	22	14.1	5.4	60.1
22	151	04.2		30.1	198	28.3	4.4	22	08.7	5.6	60.2
23	166	04.4		29.1	212	51.7	4.5	22	03.1	5.7	60.2
14 00	181	04.6	N 3	28.2	227	15.2	4.6	N21	57.4	5.8	60.2
01	196	04.9		27.2	241	38.8	4.5	21	51.6	6.1	60.2
02	211	05.1		26.3	256	02.3	4.5	21	45.5	6.1	60.3
03	226	05.3	. .	25.3	270	25.8	4.6	21	39.4	6.4	60.3
04	241	05.5		24.3	284	49.4	4.5	21	33.0	6.5	60.3
05	256	05.7		23.4	299	12.9	4.6	21	26.5	6.6	60.3
06	271	06.0	N 3	22.4	313	36.5	4.7	N21	19.9	6.8	60.4
07	286	06.2		21.5	328	00.2	4.6	21	13.1	7.0	60.4
V 08	301	06.4		20.5	342	23.8	4.7	21	06.1	7.1	60.4
I 09	316	06.6	. .	19.6	356	47.5	4.7	20	59.0	7.3	60.5
E 10	331	06.9		18.6	11	11.2	4.7	20	51.7	7.4	60.5
11	346	07.1		17.6	25	34.9	4.7	20	44.3	7.6	60.5
R 12	1	07.3	N 3	16.7	39	58.6	4.8	N20	36.7	7.7	60.5
N 13	16	07.5		15.7	54	22.4	4.8	20	29.0	7.9	60.6
E 14	31	07.7		14.7	68	46.2	4.9	20	21.1	8.0	60.6
S 15	46	08.0	. .	13.8	83	10.1	4.8	20	13.1	8.2	60.6
16	61	08.2		12.8	97	33.9	4.9	20	04.9	8.3	60.6
17	76	08.4		11.9	111	57.8	5.0	19	56.6	8.5	60.7
18	91	08.6	N 3	10.9	126	21.8	5.0	N19	48.1	8.6	60.7
19	106	08.8		09.9	140	45.8	5.0	19	39.5	8.7	60.7
20	121	09.1		09.0	155	09.8	5.1	19	30.8	8.9	60.7
21	136	09.3	. .	08.0	169	33.9	5.1	19	21.9	9.1	60.7
22	151	09.5		07.1	183	58.0	5.1	19	12.8	9.2	60.8
23	166	09.7		06.1	198	22.1	5.2	19	03.6	9.3	60.8
15 00	181	10.0	N 3	05.1	212	46.3	5.2	N18	54.3	9.4	60.8
01	196	10.2		04.2	227	10.5	5.3	18	44.9	9.6	60.8
02	211	10.4		03.2	241	34.8	5.3	18	35.3	9.7	60.8
03	226	10.6	. .	02.2	255	59.1	5.4	18	25.6	9.9	60.9
04	241	10.8		01.3	270	23.5	5.4	18	15.7	10.0	60.9
05	256	11.1		00.3	284	47.9	5.5	18	05.7	10.1	60.9
06	271	11.3	N 2	59.4	299	12.4	5.5	N17	55.6	10.3	60.9
07	286	11.5		58.4	313	36.9	5.5	17	45.3	10.4	60.9
S 08	301	11.7		57.4	328	01.4	5.6	17	34.9	10.5	61.0
A 09	316	12.0	. .	56.5	342	26.0	5.7	17	24.4	10.6	61.0
B 10	331	12.2		55.5	356	50.7	5.7	17	13.8	10.8	61.0
11	346	12.4		54.6	11	15.4	5.8	17	03.0	10.8	61.0
A 12	1	12.6	N 2	53.6	25	40.2	5.8	N16	52.2	11.0	61.0
D 13	16	12.8		52.6	40	05.0	5.9	16	41.2	11.2	61.0
14	31	13.1		51.7	54	29.9	5.9	16	30.0	11.2	61.0
O 15	46	13.3	. .	50.7	68	54.8	6.0	16	18.8	11.4	61.1
16	61	13.5		49.7	83	19.8	6.0	16	07.4	11.4	61.1
17	76	13.7		48.8	97	44.8	6.1	15	56.0	11.6	61.1
18	91	13.9	N 2	47.8	112	09.9	6.1	N15	44.4	11.7	61.1
19	106	14.2		46.8	126	35.0	6.2	15	32.7	11.8	61.1
20	121	14.4		45.9	141	00.2	6.3	15	20.9	11.9	61.1
21	136	14.6	. .	44.9	155	25.5	6.3	15	09.0	12.0	61.1
22	151	14.8		44.0	169	50.8	6.3	14	57.0	12.2	61.1
23	166	15.1		43.0	184	16.1	6.5	N14	44.8	12.2	61.2
	SD	15.9	d	1.0	SD		16.3		16.5		16.6

Lat.	Crepúsculo Náutico	Crepúsculo Civil	Orto Sol	Orto Luna 13	Orto Luna 14	Orto Luna 15	Orto Luna 16
°	h m	h m	h m	h m	h m	h m	h m
N 72	01 59	03 50	05 03	▭	▭	▭	01 27
N 70	02 33	04 04	05 08	▭	23 07	25 57	01 57
68	02 57	04 15	05 13	▭	▭	00 01	02 20
66	03 15	04 24	05 17	22 28	24 33	00 33	02 37
64	03 29	04 31	05 20	23 07	24 57	00 57	02 51
62	03 41	04 37	05 23	23 34	25 16	01 16	03 03
60	03 50	04 43	05 25	23 56	25 31	01 31	03 13
N 58	03 59	04 48	05 28	24 13	00 13	01 44	03 22
56	04 06	04 52	05 30	24 27	00 27	01 55	03 29
54	04 12	04 55	05 31	24 40	00 40	02 05	03 36
52	04 18	04 59	05 33	24 51	00 51	02 14	03 42
50	04 23	05 02	05 34	25 00	01 00	02 22	03 47
45	04 33	05 08	05 37	00 11	01 21	02 38	03 59
N 40	04 41	05 13	05 40	00 29	01 37	02 52	04 09
35	04 47	05 17	05 42	00 44	01 51	03 03	04 17
30	04 52	05 20	05 44	00 58	02 04	03 13	04 24
20	04 59	05 25	05 47	01 20	02 24	03 30	04 36
N 10	05 04	05 29	05 50	01 40	02 42	03 45	04 47
0	05 08	05 32	05 52	01 58	02 59	03 59	04 57
S 10	05 09	05 34	05 55	02 16	03 16	04 13	05 07
20	05 09	05 35	05 57	02 36	03 34	04 28	05 18
30	05 08	05 36	06 00	02 58	03 54	04 45	05 30
35	05 06	05 36	06 01	03 12	04 06	04 54	05 37
40	05 04	05 36	06 03	03 27	04 20	05 06	05 45
45	05 01	05 35	06 04	03 45	04 36	05 19	05 55
S 50	04 57	05 34	06 07	04 08	04 56	05 34	06 06
52	04 55	05 34	06 07	04 18	05 05	05 42	06 11
54	04 52	05 33	06 09	04 31	05 16	05 50	06 16
56	04 49	05 33	06 10	04 45	05 28	05 59	06 23
58	04 46	05 32	06 11	05 01	05 42	06 10	06 30
S 60	04 42	05 31	06 12	05 20	05 58	06 21	06 37

Lat.	Ocaso Sol	Crepúsculo Civil	Crepúsculo Náutico	Ocaso Luna 13	Ocaso Luna 14	Ocaso Luna 15	Ocaso Luna 16
°	h m	h m	h m	h m	h m	h m	h m
N 72	18 46	19 58	21 45	▭	▭	20 21	19 42
N 70	18 40	19 44	21 13	▭	20 36	19 49	19 27
68	18 36	19 34	20 50	▭	19 41	19 25	19 14
66	18 32	19 25	20 33	19 06	19 07	19 06	19 04
64	18 29	19 18	20 19	18 26	18 43	18 51	18 55
62	18 27	19 12	20 08	17 58	18 23	18 38	18 47
60	18 24	19 06	19 59	17 37	18 07	18 27	18 41
N 58	18 22	19 02	19 50	17 19	17 54	18 17	18 35
56	18 20	18 58	19 43	17 05	17 42	18 09	18 30
54	18 19	18 54	19 37	16 52	17 31	18 01	18 25
52	18 17	18 51	19 32	16 41	17 22	17 55	18 21
50	18 16	18 48	19 27	16 30	17 14	17 48	18 17
45	18 13	18 42	19 17	16 09	16 56	17 35	18 08
N 40	18 10	18 38	19 10	15 52	16 41	17 24	18 01
35	18 08	18 34	19 04	15 38	16 29	17 15	17 55
30	18 07	18 31	18 59	15 25	16 18	17 06	17 50
20	18 04	18 26	18 51	15 04	16 00	16 52	17 40
N 10	18 01	18 22	18 47	14 45	15 43	16 39	17 32
0	17 59	18 19	18 43	14 27	15 28	16 27	17 24
S 10	17 57	18 18	18 42	14 09	15 12	16 15	17 16
20	17 54	18 16	18 42	13 50	14 56	16 02	17 07
30	17 52	18 16	18 44	13 28	14 36	15 47	16 57
35	17 51	18 16	18 45	13 15	14 25	15 38	16 52
40	17 49	18 16	18 48	13 00	14 12	15 28	16 45
45	17 47	18 17	18 51	12 43	13 57	15 16	16 37
S 50	17 45	18 18	18 55	12 20	13 38	15 02	16 28
52	17 45	18 18	18 57	12 10	13 28	14 55	16 24
54	17 44	18 19	19 00	11 58	13 18	14 47	16 19
56	17 42	18 20	19 03	11 44	13 07	14 39	16 14
58	17 41	18 20	19 06	11 28	12 54	14 29	16 08
S 60	17 40	18 21	19 10	11 09	12 38	14 18	16 01

Día	SOL E.T. (+) 00h	SOL E.T. (+) 12h	SOL Pas. Mer.	LUNA Pas. Sup.	LUNA Mer. Inf.	LUNA Edad	LUNA Fase
d	m s	m s	h m	h m	h m	d	%
13	03 57	04 07	11 56	08 13	20 43	25	22
14	04 18	04 29	11 56	09 13	21 43	26	13
15	04 39	04 50	11 55	10 13	22 42	27	6

T.U.	ARIES	VENUS −4.0		MARTE −0.6		JUPITER −2.2		SATURNO +0.0	
d h	A.H.G.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.
	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
16 00	355 00.4	208 38.2	N14 14.9	80 42.9	S26 38.5	251 44.7	N22 41.0	281 13.4	N20 47.4
01	10 02.9	223 37.7	14.0	95 43.8	38.4	266 46.8	41.0	296 15.8	47.4
02	25 05.4	238 37.2	13.1	110 44.7	38.3	281 48.9	41.0	311 18.2	47.4
03	40 07.8	253 36.7	12.2	125 45.7	38.2	296 51.0	41.0	326 20.6	47.4
04	55 10.3	268 36.2	11.3	140 46.6	38.1	311 53.1	40.9	341 23.0	47.4
05	70 12.8	283 35.6	10.4	155 47.5	38.0	326 55.2	40.9	356 25.4	47.4
06	85 15.2	298 35.1	N14 09.5	170 48.5	S26 37.9	341 57.3	N22 40.9	11 27.8	N20 47.4
07	100 17.7	313 34.6	08.6	185 49.4	37.8	356 59.4	40.8	26 30.2	47.4
D 08	115 20.2	328 34.1	07.6	200 50.3	37.7	12 01.5	40.8	41 32.7	47.4
O 09	130 22.6	343 33.5	06.7	215 51.3	37.5	27 03.6	40.8	56 35.1	47.4
M 10	145 25.1	358 33.0	05.8	230 52.2	37.4	42 05.7	40.8	71 37.5	47.4
I 11	160 27.6	13 32.5	04.9	245 53.1	37.3	57 07.8	40.7	86 39.9	47.4
N 12	175 30.0	28 32.0	N14 04.0	260 54.1	S26 37.2	72 09.9	N22 40.7	101 42.3	N20 47.4
G 13	190 32.5	43 31.5	03.1	275 55.0	37.1	87 12.0	40.7	116 44.7	47.4
O 14	205 34.9	58 30.9	02.2	290 55.9	37.0	102 14.1	40.6	131 47.1	47.4
15	220 37.4	73 30.4	01.3	305 56.8	36.9	117 16.2	40.6	146 49.5	47.4
16	235 39.9	88 29.9	14 00.3	320 57.8	36.8	132 18.3	40.6	161 52.0	47.4
17	250 42.3	103 29.4	13 59.4	335 58.7	36.7	147 20.4	40.6	176 54.4	47.4
18	265 44.8	118 28.9	N13 58.5	350 59.6	S26 36.6	162 22.5	N22 40.5	191 56.8	N20 47.4
19	280 47.3	133 28.3	57.6	6 00.5	36.5	177 24.6	40.5	206 59.2	47.4
20	295 49.7	148 27.8	56.7	21 01.5	36.4	192 26.7	40.5	222 01.6	47.4
21	310 52.2	163 27.3	55.8	36 02.4	36.3	207 28.8	40.5	237 04.0	47.4
22	325 54.7	178 26.8	54.8	51 03.3	36.2	222 30.9	40.4	252 06.4	47.4
23	340 57.1	193 26.3	53.9	66 04.2	36.1	237 33.0	40.4	267 08.9	47.4
17 00	355 59.6	208 25.7	N13 53.0	81 05.1	S26 36.0	252 35.1	N22 40.4	282 11.3	N20 47.4
01	11 02.0	223 25.2	52.1	96 06.1	35.8	267 37.2	40.3	297 13.7	47.4
02	26 04.5	238 24.7	51.2	111 07.0	35.7	282 39.3	40.3	312 16.1	47.4
03	41 07.0	253 24.2	50.2	126 07.9	35.6	297 41.4	40.3	327 18.5	47.4
04	56 09.4	268 23.7	49.3	141 08.8	35.5	312 43.5	40.3	342 20.9	47.4
05	71 11.9	283 23.2	48.4	156 09.7	35.4	327 45.6	40.2	357 23.3	47.4
06	86 14.4	298 22.6	N13 47.5	171 10.7	S26 35.3	342 47.7	N22 40.2	12 25.8	N20 47.4
07	101 16.8	313 22.1	46.5	186 11.6	35.2	357 49.8	40.2	27 28.2	47.4
L 08	116 19.3	328 21.6	45.6	201 12.5	35.1	12 51.9	40.2	42 30.6	47.4
U 09	131 21.8	343 21.1	44.7	216 13.4	35.0	27 54.0	40.1	57 33.0	47.4
N 10	146 24.2	358 20.6	43.8	231 14.3	34.9	42 56.1	40.1	72 35.4	47.4
E 11	161 26.7	13 20.1	42.8	246 15.3	34.7	57 58.2	40.1	87 37.8	47.4
S 12	176 29.2	28 19.6	N13 41.9	261 16.2	S26 34.6	73 00.3	N22 40.0	102 40.3	N20 47.4
13	191 31.6	43 19.0	41.0	276 17.1	34.5	88 02.4	40.0	117 42.7	47.4
14	206 34.1	58 18.5	40.0	291 18.0	34.4	103 04.5	40.0	132 45.1	47.4
15	221 36.5	73 18.0	39.1	306 18.9	34.3	118 06.6	40.0	147 47.5	47.4
16	236 39.0	88 17.5	38.2	321 19.8	34.2	133 08.7	39.9	162 49.9	47.4
17	251 41.5	103 17.0	37.2	336 20.7	34.1	148 10.9	39.9	177 52.4	47.4
18	266 43.9	118 16.5	N13 36.3	351 21.6	S26 34.0	163 13.0	N22 39.9	192 54.8	N20 47.4
19	281 46.4	133 16.0	35.4	6 22.6	33.8	178 15.1	39.8	207 57.2	47.4
20	296 48.9	148 15.5	34.4	21 23.5	33.7	193 17.2	39.8	222 59.6	47.4
21	311 51.3	163 14.9	33.5	36 24.4	33.6	208 19.3	39.8	238 02.0	47.4
22	326 53.8	178 14.4	32.6	51 25.3	33.5	223 21.4	39.8	253 04.4	47.4
23	341 56.3	193 13.9	31.6	66 26.2	33.4	238 23.5	39.7	268 06.9	47.4
18 00	356 58.7	208 13.4	N13 30.7	81 27.1	S26 33.3	253 25.6	N22 39.7	283 09.3	N20 47.4
01	12 01.2	223 12.9	29.8	96 28.0	33.2	268 27.7	39.7	298 11.7	47.4
02	27 03.6	238 12.4	28.8	111 28.9	33.0	283 29.8	39.7	313 14.1	47.4
03	42 06.1	253 11.9	27.9	126 29.8	32.9	298 31.9	39.6	328 16.5	47.4
04	57 08.6	268 11.4	26.9	141 30.7	32.8	313 34.0	39.6	343 19.0	47.4
05	72 11.0	283 10.9	26.0	156 31.6	32.7	328 36.1	39.6	358 21.4	47.4
06	87 13.5	298 10.4	N13 25.1	171 32.6	S26 32.6	343 38.3	N22 39.5	13 23.8	N20 47.4
07	102 16.0	313 09.9	24.1	186 33.5	32.5	358 40.4	39.5	28 26.2	47.4
M 08	117 18.4	328 09.3	23.2	201 34.4	32.3	13 42.5	39.5	43 28.6	47.4
A 09	132 20.9	343 08.8	22.2	216 35.3	32.2	28 44.6	39.5	58 31.1	47.4
R 10	147 23.4	358 08.3	21.3	231 36.2	32.1	43 46.7	39.4	73 33.5	47.4
T 11	162 25.8	13 07.8	20.3	246 37.1	32.0	58 48.8	39.4	88 35.9	47.4
E 12	177 28.3	28 07.3	N13 19.4	261 38.0	S26 31.9	73 50.9	N22 39.4	103 38.3	N20 47.4
13	192 30.8	43 06.8	18.4	276 38.9	31.8	88 53.0	39.4	118 40.8	47.4
S 14	207 33.2	58 06.3	17.5	291 39.8	31.6	103 55.1	39.3	133 43.2	47.4
15	222 35.7	73 05.8	16.5	306 40.7	31.5	118 57.3	39.3	148 45.6	47.4
16	237 38.1	88 05.3	15.6	321 41.6	31.4	133 59.4	39.3	163 48.0	47.4
17	252 40.6	103 04.8	14.7	336 42.5	31.3	149 01.5	39.2	178 50.5	47.4
18	267 43.1	118 04.3	N13 13.7	351 43.4	S26 31.2	164 03.6	N22 39.2	193 52.9	N20 47.4
19	282 45.5	133 03.8	12.8	6 44.3	31.0	179 05.7	39.2	208 55.3	47.4
20	297 48.0	148 03.3	11.8	21 45.2	30.9	194 07.8	39.2	223 57.7	47.4
21	312 50.5	163 02.8	10.8	36 46.1	30.8	209 09.9	39.1	239 00.1	47.4
22	327 52.9	178 02.3	09.9	51 47.0	30.7	224 12.0	39.1	254 02.6	47.4
23	342 55.4	193 01.8	08.9	66 47.9	30.6	239 14.2	39.1	269 05.0	47.4
	h m								
Pas. Mer.	0 16.0	*v* −0.5	*d* 0.9	*v* 0.9	*d* 0.1	*v* 2.1	*d* 0.0	*v* 2.4	*d* 0.0

ESTRELLAS		
Nombre	A.H.S.	Dec.
	° ′	° ′
Acamar	315 25.0	S40 17.7
Achernar	335 33.0	S57 13.6
Acrux	173 20.5	S63 06.4
Adhara	255 19.9	S28 58.2
Aldebaran	290 59.9	N16 30.8
Alioth	166 29.2	N55 57.3
Alkaid	153 06.5	N49 18.6
Al Na'ir	27 54.8	S46 57.3
Alnilam	275 55.7	S 1 11.9
Alphard	218 05.4	S 8 39.7
Alphecca	126 19.0	N26 42.8
Alpheratz	357 52.8	N29 06.0
Altair	62 17.1	N 8 52.5
Ankaa	353 24.3	S42 17.8
Antares	112 37.7	S26 26.1
Arcturus	146 04.4	N19 10.7
Atria	107 48.0	S69 02.0
Avior	234 22.3	S59 30.6
Bellatrix	278 41.9	N 6 21.2
Betelgeuse	271 11.3	N 7 24.5
Canopus	264 00.4	S52 41.5
Capella	280 48.1	N45 59.8
Deneb	49 37.5	N45 17.4
Denebola	182 43.4	N14 34.0
Diphda	349 04.8	S17 58.6
Dubhe	194 03.5	N61 44.6
Elnath	278 24.3	N28 36.5
Eltanin	90 50.4	N51 29.6
Enif	33 55.9	N 9 53.0
Fomalhaut	15 33.7	S29 36.8
Gacrux	172 11.9	S57 07.2
Gienah	176 02.2	S17 32.9
Hadar	149 01.7	S60 22.9
Hamal	328 11.0	N23 28.2
Kaus Aust.	83 56.0	S34 23.1
Kochab	137 20.2	N74 09.2
Markab	13 47.2	N15 12.9
Menkar	314 24.5	N 4 05.8
Menkent	148 18.9	S36 22.6
Miaplacidus	221 42.5	S69 43.1
Mirfak	308 53.4	N49 51.9
Nunki	76 09.6	S26 17.7
Peacock	53 33.3	S56 44.0
Pollux	243 39.2	N28 01.4
Procyon	245 09.5	N 5 13.4
Rasalhague	96 15.0	N12 33.7
Regulus	207 53.6	N11 57.7
Rigel	281 20.9	S 8 11.8
Rigil Kent.	140 05.1	S60 50.5
Sabik	102 23.2	S15 43.5
Schedar	349 50.7	N56 32.7
Shaula	96 34.5	S37 06.4
Sirius	258 42.0	S16 42.9
Spica	158 41.3	S11 10.0
Suhail	222 59.6	S43 26.1
Vega	80 45.1	N38 47.4
Zuben'ubi	137 15.9	S16 02.8

	A.H.S.	Pas. Mer.
	° ′	h m
Venus	212 26.2	10 07
Marte	85 05.6	18 35
Jupiter	256 35.5	7 09
Saturno	286 11.7	5 10

T.U.	SOL				LUNA						
	A.H.G.		Dec.		A.H.G.	v		Dec.	d	P.H.	
d h	°	′	°	′	°	′	′	°	′	′	′
16 00	181	15.3	N 2	42.0	198	41.6	6.4	N14	32.6	12.3	61.2
01	196	15.5		41.1	213	07.0	6.6	14	20.3	12.4	61.2
02	211	15.7		40.1	227	32.6	6.6	14	07.9	12.6	61.2
03	226	15.9	. .	39.1	241	58.2	6.6	13	55.3	12.6	61.2
04	241	16.2		38.2	256	23.8	6.7	13	42.7	12.7	61.2
05	256	16.4		37.2	270	49.5	6.8	13	30.0	12.8	61.2
06	271	16.6	N 2	36.2	285	15.3	6.8	N13	17.2	12.9	61.2
07	286	16.8		35.3	299	41.1	6.9	13	04.3	13.0	61.2
D 08	301	17.1		34.3	314	07.0	6.9	12	51.3	13.1	61.2
O 09	316	17.3	. .	33.3	328	32.9	7.0	12	38.2	13.1	61.2
M 10	331	17.5		32.4	342	58.9	7.1	12	25.1	13.3	61.2
11	346	17.7		31.4	357	25.0	7.1	12	11.8	13.3	61.2
I 12	1	17.9	N 2	30.4	11	51.1	7.1	N11	58.5	13.4	61.2
N 13	16	18.2		29.5	26	17.2	7.2	11	45.1	13.5	61.2
G 14	31	18.4		28.5	40	43.4	7.3	11	31.6	13.6	61.2
O 15	46	18.6	. .	27.6	55	09.7	7.3	11	18.0	13.6	61.2
16	61	18.8		26.6	69	36.0	7.4	11	04.4	13.7	61.2
17	76	19.1		25.6	84	02.4	7.5	10	50.7	13.8	61.2
18	91	19.3	N 2	24.7	98	28.9	7.4	N10	36.9	13.8	61.2
19	106	19.5		23.7	112	55.3	7.6	10	23.1	13.9	61.2
20	121	19.7		22.7	127	21.9	7.6	10	09.2	14.0	61.2
21	136	19.9	. .	21.8	141	48.5	7.7	9	55.2	14.0	61.2
22	151	20.2		20.8	156	15.2	7.7	9	41.2	14.1	61.2
23	166	20.4		19.8	170	41.9	7.7	9	27.1	14.2	61.2
17 00	181	20.6	N 2	18.9	185	08.6	7.8	N 9	12.9	14.2	61.2
01	196	20.8		17.9	199	35.4	7.9	8	58.7	14.3	61.2
02	211	21.1		16.9	214	02.3	7.9	8	44.4	14.3	61.2
03	226	21.3	. .	16.0	228	29.2	8.0	8	30.1	14.4	61.2
04	241	21.5		15.0	242	56.2	8.0	8	15.7	14.4	61.2
05	256	21.7		14.0	257	23.2	8.1	8	01.3	14.5	61.2
06	271	21.9	N 2	13.1	271	50.3	8.1	N 7	46.8	14.5	61.2
07	286	22.2		12.1	286	17.4	8.2	7	32.3	14.5	61.2
L 08	301	22.4		11.1	300	44.6	8.2	7	17.8	14.6	61.2
U 09	316	22.6	. .	10.2	315	11.8	8.3	7	03.2	14.7	61.1
N 10	331	22.8		09.2	329	39.1	8.3	6	48.5	14.6	61.1
E 11	346	23.1		08.2	344	06.4	8.4	6	33.9	14.8	61.1
S 12	1	23.3	N 2	07.3	358	33.8	8.4	N 6	19.1	14.7	61.1
13	16	23.5		06.3	13	01.2	8.4	6	04.4	14.8	61.1
14	31	23.7		05.3	27	28.6	8.5	5	49.6	14.8	61.1
15	46	23.9	. .	04.4	41	56.1	8.6	5	34.8	14.8	61.1
16	61	24.2		03.4	56	23.7	8.6	5	20.0	14.9	61.1
17	76	24.4		02.4	70	51.3	8.6	5	05.1	14.9	61.1
18	91	24.6	N 2	01.5	85	18.9	8.7	N 4	50.2	14.9	61.0
19	106	24.8	2	00.5	99	46.6	8.7	4	35.3	15.0	61.0
20	121	25.1	1	59.5	114	14.3	8.8	4	20.3	14.9	61.0
21	136	25.3	. .	58.6	128	42.1	8.8	4	05.4	15.0	61.0
22	151	25.5		57.6	143	09.9	8.8	3	50.4	15.0	61.0
23	166	25.7		56.6	157	37.7	8.9	3	35.4	15.0	61.0
18 00	181	25.9	N 1	55.7	172	05.6	8.9	N 3	20.4	15.0	60.9
01	196	26.2		54.7	186	33.5	9.0	3	05.4	15.0	60.9
02	211	26.4		53.7	201	01.5	9.0	2	50.4	15.0	60.9
03	226	26.6	. .	52.7	215	29.5	9.0	2	35.4	15.1	60.9
04	241	26.8		51.8	229	57.5	9.1	2	20.3	15.0	60.9
05	256	27.0		50.8	244	25.6	9.1	2	05.3	15.0	60.8
06	271	27.3	N 1	49.8	258	53.7	9.1	N 1	50.3	15.1	60.8
07	286	27.5		48.9	273	21.8	9.2	1	35.2	15.0	60.8
M 08	301	27.7		47.9	287	50.0	9.2	1	20.2	15.1	60.8
A 09	316	27.9	. .	46.9	302	18.2	9.2	1	05.1	15.0	60.8
R 10	331	28.2		46.0	316	46.4	9.3	0	50.1	15.0	60.7
11	346	28.4		45.0	331	14.7	9.2	0	35.1	15.0	60.7
T 12	1	28.6	N 1	44.0	345	42.9	9.4	N 0	20.1	15.1	60.7
13	16	28.8		43.1	0	11.3	9.3	N 0	05.0	15.0	60.7
E 14	31	29.0		42.1	14	39.6	9.4	S 0	10.0	14.9	60.6
15	46	29.3	. .	41.1	29	08.0	9.4	0	24.9	15.0	60.6
S 16	61	29.5		40.2	43	36.4	9.4	0	39.9	15.0	60.6
17	76	29.7		39.2	58	04.8	9.5	0	54.9	14.9	60.6
18	91	29.9	N 1	38.2	72	33.3	9.5	S 1	09.8	14.9	60.5
19	106	30.2		37.2	87	01.8	9.5	1	24.7	14.9	60.5
20	121	30.4		36.3	101	30.3	9.5	1	39.6	14.9	60.5
21	136	30.6	. .	35.3	115	58.8	9.6	1	54.5	14.8	60.5
22	151	30.8		34.3	130	27.4	9.5	2	09.3	14.9	60.4
23	166	31.0		33.4	144	55.9	9.6	S 2	24.2	14.7	60.4
	SD	15.9	d	1.0	SD		16.7		16.7		16.5

Lat.	Crepúsculo Náutico	Crepúsculo Civil	Orto Sol	Orto Luna 16	Orto Luna 17	Orto Luna 18	Orto Luna 19
°	h m	h m	h m	h m	h m	h m	h m
N 72	02 24	04 05	05 16	01 27	04 05	06 26	08 42
N 70	02 51	04 17	05 20	01 57	04 18	06 29	08 35
68	03 11	04 26	05 23	02 20	04 28	06 30	08 29
66	03 27	04 34	05 26	02 37	04 37	06 32	08 24
64	03 40	04 40	05 29	02 51	04 44	06 33	08 20
62	03 50	04 46	05 31	03 03	04 50	06 34	08 16
60	03 59	04 50	05 32	03 13	04 55	06 35	08 13
N 58	04 06	04 54	05 34	03 22	05 00	06 36	08 11
56	04 13	04 58	05 35	03 29	05 04	06 37	08 08
54	04 18	05 01	05 37	03 36	05 07	06 38	08 06
52	04 23	05 04	05 38	03 42	05 11	06 38	08 04
50	04 28	05 06	05 39	03 47	05 14	06 39	08 02
45	04 37	05 11	05 41	03 59	05 20	06 40	07 58
N 40	04 44	05 16	05 43	04 09	05 26	06 41	07 55
35	04 49	05 19	05 44	04 17	05 30	06 42	07 52
30	04 54	05 22	05 46	04 24	05 34	06 43	07 50
20	05 00	05 26	05 48	04 36	05 41	06 44	07 46
N 10	05 04	05 29	05 50	04 47	05 47	06 46	07 42
0	05 07	05 31	05 51	04 57	05 53	06 47	07 39
S 10	05 07	05 32	05 53	05 07	05 59	06 48	07 36
20	05 07	05 32	05 54	05 18	06 05	06 49	07 32
30	05 04	05 32	05 56	05 30	06 12	06 51	07 28
35	05 02	05 31	05 57	05 37	06 16	06 52	07 26
40	04 59	05 31	05 58	05 45	06 20	06 53	07 24
45	04 55	05 30	05 59	05 55	06 26	06 54	07 21
S 50	04 50	05 28	06 00	06 06	06 32	06 55	07 17
52	04 48	05 27	06 00	06 11	06 35	06 56	07 16
54	04 45	05 26	06 01	06 16	06 38	06 56	07 14
56	04 41	05 25	06 02	06 23	06 41	06 57	07 12
58	04 37	05 23	06 02	06 30	06 45	06 58	07 10
S 60	04 33	05 22	06 03	06 37	06 49	06 59	07 08

Lat.	Ocaso Sol	Crepúsculo Civil	Crepúsculo Náutico	Ocaso Luna 16	Ocaso Luna 17	Ocaso Luna 18	Ocaso Luna 19
°	h m	h m	h m	h m	h m	h m	h m
N 72	18 30	19 40	21 19	19 42	19 16	18 52	18 29
N 70	18 26	19 29	20 53	19 27	19 10	18 54	18 39
68	18 23	19 20	20 34	19 14	19 05	18 56	18 47
66	18 21	19 13	20 19	19 04	19 01	18 58	18 54
64	18 19	19 07	20 07	18 55	18 57	18 59	19 00
62	18 17	19 01	19 57	18 47	18 54	19 00	19 06
60	18 15	18 57	19 48	18 41	18 51	19 01	19 10
N 58	18 14	18 53	19 41	18 35	18 49	19 02	19 14
56	18 12	18 50	19 35	18 30	18 47	19 02	19 18
54	18 11	18 47	19 29	18 25	18 45	19 03	19 21
52	18 10	18 44	19 24	18 21	18 43	19 04	19 24
50	18 09	18 42	19 20	18 17	18 41	19 04	19 27
45	18 07	18 37	19 11	18 08	18 38	19 05	19 33
N 40	18 06	18 33	19 04	18 01	18 35	19 06	19 38
35	18 04	18 29	18 59	17 55	18 32	19 07	19 42
30	18 03	18 27	18 55	17 50	18 30	19 08	19 46
20	18 01	18 23	18 49	17 40	18 26	19 09	19 52
N 10	17 59	18 20	18 45	17 32	18 22	19 11	19 58
0	17 58	18 18	18 42	17 24	18 19	19 12	20 04
S 10	17 56	18 17	18 42	17 16	18 15	19 13	20 09
20	17 55	18 17	18 43	17 07	18 11	19 14	20 15
30	17 54	18 17	18 45	16 57	18 07	19 15	20 22
35	17 53	18 18	18 47	16 52	18 05	19 16	20 25
40	17 52	18 19	18 50	16 45	18 02	19 17	20 30
45	17 51	18 20	18 54	16 37	17 58	19 17	20 35
S 50	17 50	18 22	19 00	16 28	17 54	19 19	20 41
52	17 49	18 23	19 03	16 24	17 52	19 19	20 44
54	17 49	18 24	19 06	16 19	17 50	19 20	20 47
56	17 48	18 25	19 09	16 14	17 48	19 20	20 50
58	17 48	18 27	19 13	16 08	17 45	19 21	20 54
S 60	17 47	18 28	19 18	16 01	17 42	19 22	20 59

Día	SOL E.T. (+) 00h	SOL E.T. (+) 12h	SOL Pas. Mer.	LUNA Pas. Sup.	LUNA Mer. Inf.	LUNA Edad	LUNA Fase
d	m s	m s	h m	h m	h m	d	%
16	05 01	05 11	11 55	11 11	23 39	28	2
17	05 22	05 33	11 54	12 06	24 33	00	0
18	05 43	05 54	11 54	12 59	00 33	01	2

T.U.	ARIES	VENUS −3.9		MARTE −0.5		JUPITER −2.2		SATURNO +0.0		ESTRELLAS		
	A.H.G.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.	Nombre	A.H.S.	Dec.
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′		° ′	° ′
22 00	0 55.3	207 25.9	N11 57.7	82 52.1	S26 20.9	256 49.2	N22 37.1	287 02.5	N20 47.3	Acamar	315 25.0	S40 17.7
01	15 57.7	222 25.4	56.7	97 52.9	20.8	271 51.3	37.1	302 05.0	47.3	Achernar	335 33.0	S57 13.6
02	31 00.2	237 24.9	55.7	112 53.8	20.6	286 53.5	37.1	317 07.4	47.3	Acrux	173 20.5	S63 06.4
03	46 02.7	252 24.4 . .	54.7	127 54.6 . .	20.5	301 55.6 . .	37.0	332 09.8 . .	47.3	Adhara	255 19.9	S28 58.2
04	61 05.1	267 23.9	53.7	142 55.5	20.4	316 57.7	37.0	347 12.3	47.3	Aldebaran	290 59.9	N16 30.8
05	76 07.6	282 23.5	52.7	157 56.4	20.2	331 59.9	37.0	2 14.7	47.3			
06	91 10.1	297 23.0	N11 51.7	172 57.2	S26 20.1	347 02.0	N22 37.0	17 17.2	N20 47.2	Alioth	166 29.2	N55 57.3
S 07	106 12.5	312 22.5	50.7	187 58.1	19.9	2 04.1	36.9	32 19.6	47.2	Alkaid	153 06.5	N49 18.6
08	121 15.0	327 22.0	49.7	202 58.9	19.8	17 06.3	36.9	47 22.0	47.2	Al Na'ir	27 54.8	S46 57.3
A 09	136 17.4	342 21.5 . .	48.7	217 59.8 . .	19.6	32 08.4 . .	36.9	62 24.5 . .	47.2	Alnilam	275 55.7	S 1 11.9
10	151 19.9	357 21.1	47.7	233 00.7	19.5	47 10.6	36.9	77 26.9	47.2	Alphard	218 05.4	S 8 39.7
B 11	166 22.4	12 20.6	46.6	248 01.5	19.3	62 12.7	36.8	92 29.4	47.2			
A 12	181 24.8	27 20.1	N11 45.6	263 02.4	S26 19.2	77 14.8	N22 36.8	107 31.8	N20 47.2	Alphecca	126 19.0	N26 42.8
13	196 27.3	42 19.6	44.6	278 03.2	19.1	92 17.0	36.8	122 34.2	47.2	Alpheratz	357 52.8	N29 06.0
D 14	211 29.8	57 19.2	43.6	293 04.1	18.9	107 19.1	36.8	137 36.7	47.2	Altair	62 17.1	N 8 52.5
15	226 32.2	72 18.7 . .	42.6	308 04.9 . .	18.8	122 21.2 . .	36.7	152 39.1 . .	47.2	Ankaa	353 24.3	S42 17.8
O 16	241 34.7	87 18.2	41.6	323 05.8	18.6	137 23.4	36.7	167 41.6	47.2	Antares	112 37.8	S26 26.1
17	256 37.2	102 17.7	40.6	338 06.6	18.5	152 25.5	36.7	182 44.0	47.2			
18	271 39.6	117 17.3	N11 39.6	353 07.5	S26 18.3	167 27.7	N22 36.6	197 46.5	N20 47.2	Arcturus	146 04.4	N19 10.7
19	286 42.1	132 16.8	38.6	8 08.4	18.2	182 29.8	36.6	212 48.9	47.2	Atria	107 48.1	S69 02.0
20	301 44.6	147 16.3	37.6	23 09.2	18.0	197 31.9	36.6	227 51.3	47.2	Avior	234 22.2	S59 30.5
21	316 47.0	162 15.8 . .	36.6	38 10.1 . .	17.9	212 34.1 . .	36.6	242 53.8 . .	47.2	Bellatrix	278 41.9	N 6 21.2
22	331 49.5	177 15.4	35.5	53 10.9	17.7	227 36.2	36.5	257 56.2	47.2	Betelgeuse	271 11.3	N 7 24.5
23	346 51.9	192 14.9	34.5	68 11.8	17.6	242 38.4	36.5	272 58.7	47.2			
23 00	1 54.4	207 14.4	N11 33.5	83 12.6	S26 17.4	257 40.5	N22 36.5	288 01.1	N20 47.2	Canopus	264 00.3	S52 41.5
01	16 56.9	222 13.9	32.5	98 13.5	17.3	272 42.6	36.5	303 03.6	47.2	Capella	280 48.0	N45 59.8
02	31 59.3	237 13.5	31.5	113 14.3	17.1	287 44.8	36.4	318 06.0	47.2	Deneb	49 37.5	N45 17.4
03	47 01.8	252 13.0 . .	30.5	128 15.2 . .	17.0	302 46.9 . .	36.4	333 08.4 . .	47.2	Denebola	182 43.4	N14 34.0
04	62 04.3	267 12.5	29.5	143 16.0	16.8	317 49.1	36.4	348 10.9	47.2	Diphda	349 04.8	S17 58.6
05	77 06.7	282 12.0	28.5	158 16.9	16.7	332 51.2	36.4	3 13.3	47.2			
06	92 09.2	297 11.6	N11 27.4	173 17.7	S26 16.5	347 53.3	N22 36.3	18 15.8	N20 47.2	Dubhe	194 03.4	N61 44.6
07	107 11.7	312 11.1	26.4	188 18.6	16.4	2 55.5	36.3	33 18.2	47.2	Elnath	278 24.2	N28 36.5
D 08	122 14.1	327 10.6	25.4	203 19.4	16.2	17 57.6	36.3	48 20.7	47.2	Eltanin	90 50.4	N51 29.7
O 09	137 16.6	342 10.1 . .	24.4	218 20.3 . .	16.1	32 59.8 . .	36.3	63 23.1 . .	47.2	Enif	33 55.9	N 9 53.0
10	152 19.1	357 09.7	23.4	233 21.1	15.9	48 01.9	36.2	78 25.6	47.2	Fomalhaut	15 33.7	S29 36.8
M 11	167 21.5	12 09.2	22.3	248 22.0	15.8	63 04.1	36.2	93 28.0	47.2			
I 12	182 24.0	27 08.7	N11 21.3	263 22.8	S26 15.6	78 06.2	N22 36.2	108 30.5	N20 47.2	Gacrux	172 11.9	S57 07.2
N 13	197 26.4	42 08.3	20.3	278 23.7	15.5	93 08.3	36.2	123 32.9	47.2	Gienah	176 02.2	S17 32.9
G 14	212 28.9	57 07.8	19.3	293 24.5	15.3	108 10.5	36.1	138 35.4	47.1	Hadar	149 01.7	S60 22.8
O 15	227 31.4	72 07.3 . .	18.3	308 25.3 . .	15.1	123 12.6 . .	36.1	153 37.8 . .	47.1	Hamal	328 10.9	N23 28.2
16	242 33.8	87 06.9	17.2	323 26.2	15.0	138 14.8	36.1	168 40.2	47.1	Kaus Aust.	83 56.0	S34 23.1
17	257 36.3	102 06.4	16.2	338 27.0	14.8	153 16.9	36.1	183 42.7	47.1			
18	272 38.8	117 05.9	N11 15.2	353 27.9	S26 14.7	168 19.1	N22 36.0	198 45.1	N20 47.1	Kochab	137 20.3	N74 09.2
19	287 41.2	132 05.4	14.2	8 28.7	14.5	183 21.2	36.0	213 47.6	47.1	Markab	13 47.2	N15 12.9
20	302 43.7	147 05.0	13.1	23 29.6	14.4	198 23.4	36.0	228 50.0	47.1	Menkar	314 24.5	N 4 05.8
21	317 46.2	162 04.5 . .	12.1	38 30.4 . .	14.2	213 25.5 . .	35.9	243 52.5 . .	47.1	Menkent	148 18.9	S36 22.6
22	332 48.6	177 04.0	11.1	53 31.2	14.1	228 27.6	35.9	258 54.9	47.1	Miaplacidus	221 42.5	S69 43.1
23	347 51.1	192 03.6	10.1	68 32.1	13.9	243 29.8	35.9	273 57.4	47.1			
24 00	2 53.5	207 03.1	N11 09.0	83 32.9	S26 13.7	258 31.9	N22 35.9	288 59.8	N20 47.1	Mirfak	308 53.4	N49 51.9
01	17 56.0	222 02.6	08.0	98 33.8	13.6	273 34.1	35.8	304 02.3	47.1	Nunki	76 09.7	S26 17.7
02	32 58.5	237 02.2	07.0	113 34.6	13.4	288 36.2	35.8	319 04.7	47.1	Peacock	53 33.3	S56 44.0
03	48 00.9	252 01.7 . .	06.0	128 35.5 . .	13.3	303 38.4 . .	35.8	334 07.2 . .	47.1	Pollux	243 39.1	N28 01.4
04	63 03.4	267 01.2	04.9	143 36.3	13.1	318 40.5	35.8	349 09.6	47.1	Procyon	245 09.5	N 5 13.4
05	78 05.9	282 00.8	03.9	158 37.1	13.0	333 42.7	35.7	4 12.1	47.1			
06	93 08.3	297 00.3	N11 02.9	173 38.0	S26 12.8	348 44.8	N22 35.7	19 14.5	N20 47.1	Rasalhague	96 15.1	N12 33.7
07	108 10.8	311 59.8	01.8	188 38.8	12.6	3 47.0	35.7	34 17.0	47.1	Regulus	207 53.6	N11 57.7
L 08	123 13.3	326 59.4	11 00.8	203 39.6	12.5	18 49.1	35.7	49 19.4	47.1	Rigel	281 20.9	S 8 11.8
09	138 15.7	341 58.9	10 59.8	218 40.5 . .	12.3	33 51.3 . .	35.6	64 21.9 . .	47.1	Rigil Kent	140 05.1	S60 50.5
U 10	153 18.2	356 58.4	58.7	233 41.3	12.2	48 53.4	35.6	79 24.3	47.1	Sabik	102 23.2	S15 43.5
11	168 20.7	11 58.0	57.7	248 42.2	12.0	63 55.6	35.6	94 26.8	47.1			
N 12	183 23.1	26 57.5	N10 56.7	263 43.0	S26 11.8	78 57.7	N22 35.6	109 29.2	N20 47.1	Schedar	349 50.6	N56 32.7
E 13	198 25.6	41 57.0	55.6	278 43.8	11.7	93 59.9	35.5	124 31.7	47.1	Shaula	96 34.5	S37 06.4
14	213 28.0	56 56.6	54.6	293 44.7	11.5	109 02.0	35.5	139 34.1	47.1	Sirius	258 41.9	S16 42.9
S 15	228 30.5	71 56.1 . .	53.6	308 45.5 . .	11.4	124 04.2 . .	35.5	154 36.6 . .	47.1	Spica	158 41.3	S11 10.0
16	243 33.0	86 55.7	52.5	323 46.3	11.2	139 06.3	35.5	169 39.0	47.0	Suhail	222 59.6	S43 26.0
17	258 35.4	101 55.2	51.5	338 47.2	11.0	154 08.5	35.4	184 41.5	47.0			
18	273 37.9	116 54.7	N10 50.5	353 48.0	S26 10.9	169 10.6	N22 35.4	199 43.9	N20 47.0	Vega	80 45.2	N38 47.4
19	288 40.4	131 54.3	49.4	8 48.8	10.7	184 12.8	35.4	214 46.4	47.0	Zuben'ubi	137 15.9	S16 02.8
20	303 42.8	146 53.8	48.4	23 49.7	10.6	199 14.9	35.4	229 48.8	47.0			
21	318 45.3	161 53.3 . .	47.4	38 50.5 . .	10.4	214 17.1 . .	35.3	244 51.3 . .	47.0		A.H.S.	Pas. Mer.
22	333 47.8	176 52.9	46.3	53 51.3	10.2	229 19.2	35.3	259 53.8	47.0		° ′	h m
23	348 50.2	191 52.4	45.3	68 52.2	10.1	244 21.4	35.3	274 56.2	47.0	Venus	205 20.0	10 11
	h m									Marte	81 18.2	18 26
Pas. Mer.	23 48.5	v −0.5	d 1.0	v 0.8	d 0.2	v 2.1	d 0.0	v 2.4	d 0.0	Júpiter	255 46.1	6 48
										Saturno	286 06.7	4 47

T.U.	SOL				LUNA					
	A.H.G.		Dec.		A.H.G.	v	Dec.	d	P.H.	
d h	° ′		° ′		° ′	′	° ′	′	′	
22 00	181 47.2	N	0 22.5		121 58.1	9.6	S17 41.6	9.3	57.7	
01	196 47.4		21.5		136 26.7	9.6	17 50.9	9.1	57.7	
02	211 47.6		20.5		150 55.3	9.6	18 00.0	9.1	57.6	
03	226 47.8	. .	19.5		165 23.9	9.5	18 09.1	8.9	57.6	
04	241 48.1		18.6		179 52.4	9.6	18 18.0	8.9	57.6	
05	256 48.3		17.6		194 21.0	9.6	18 26.9	8.7	57.5	
06	271 48.5	N	0 16.6		208 49.6	9.5	S18 35.6	8.6	57.5	
07	286 48.7		15.6		223 18.1	9.6	18 44.2	8.5	57.5	
S 08	301 48.9		14.7		237 46.7	9.5	18 52.7	8.4	57.4	
A 09	316 49.2	. .	13.7		252 15.2	9.5	19 01.1	8.3	57.4	
B 10	331 49.4		12.7		266 43.7	9.5	19 09.4	8.1	57.3	
A 11	346 49.6		11.8		281 12.2	9.5	19 17.5	8.0	57.3	
D 12	1 49.8	N	0 10.8		295 40.7	9.5	S19 25.5	8.0	57.3	
O 13	16 50.0		09.8		310 09.2	9.5	19 33.5	7.8	57.2	
14	31 50.2		08.8		324 37.7	9.5	19 41.3	7.6	57.2	
15	46 50.5	. .	07.9		339 06.2	9.5	19 48.9	7.6	57.1	
16	61 50.7		06.9		353 34.7	9.5	19 56.5	7.5	57.1	
17	76 50.9		05.9		8 03.2	9.4	20 04.0	7.3	57.1	
18	91 51.1	N	0 04.9		22 31.6	9.5	S20 11.3	7.2	57.0	
19	106 51.3		04.0		37 00.1	9.4	20 18.5	7.1	57.0	
20	121 51.6		03.0		51 28.5	9.5	20 25.6	7.0	57.0	
21	136 51.8	. .	02.0		65 57.0	9.4	20 32.6	6.8	56.9	
22	151 52.0		01.0		80 25.4	9.5	20 39.4	6.8	56.9	
23	166 52.2	N	00.1		94 53.9	9.4	20 46.2	6.6	56.8	
23 00	181 52.4	S	0 00.9		109 22.3	9.4	S20 52.8	6.5	56.8	
01	196 52.7		01.9		123 50.7	9.4	20 59.3	6.3	56.8	
02	211 52.9		02.8		138 19.1	9.5	21 05.6	6.3	56.7	
03	226 53.1	. .	03.8		152 47.6	9.4	21 11.9	6.1	56.7	
04	241 53.3		04.8		167 16.0	9.4	21 18.0	6.0	56.7	
05	256 53.5		05.8		181 44.4	9.4	21 24.0	5.9	56.6	
06	271 53.8	S	0 06.7		196 12.8	9.4	S21 29.9	5.8	56.6	
D 07	286 54.0		07.7		210 41.2	9.4	21 35.7	5.6	56.6	
O 08	301 54.2		08.7		225 09.6	9.4	21 41.3	5.5	56.5	
M 09	316 54.4	. .	09.7		239 38.0	9.4	21 46.8	5.4	56.5	
I 10	331 54.6		10.6		254 06.4	9.5	21 52.2	5.3	56.4	
N 11	346 54.8		11.6		268 34.9	9.4	21 57.5	5.1	56.4	
G 12	1 55.1	S	0 12.6		283 03.3	9.4	S22 02.6	5.1	56.4	
O 13	16 55.3		13.6		297 31.7	9.4	22 07.7	4.9	56.3	
14	31 55.5		14.5		312 00.1	9.4	22 12.6	4.7	56.3	
15	46 55.7	. .	15.5		326 28.5	9.4	22 17.3	4.7	56.3	
16	61 55.9		16.5		340 56.9	9.5	22 22.0	4.5	56.2	
17	76 56.2		17.5		355 25.4	9.4	22 26.5	4.4	56.2	
18	91 56.4	S	0 18.4		9 53.8	9.4	S22 30.9	4.3	56.2	
19	106 56.6		19.4		24 22.2	9.5	22 35.2	4.2	56.1	
20	121 56.8		20.4		38 50.7	9.4	22 39.4	4.0	56.1	
21	136 57.0	. .	21.3		53 19.1	9.5	22 43.4	3.9	56.1	
22	151 57.2		22.3		67 47.6	9.5	22 47.3	3.8	56.0	
23	166 57.5		23.3		82 16.1	9.4	22 51.1	3.6	56.0	
24 00	181 57.7	S	0 24.3		96 44.5	9.5	S22 54.7	3.6	56.0	
01	196 57.9	.	25.2		111 13.0	9.5	22 58.3	3.4	56.0	
02	211 58.1		26.2		125 41.5	9.5	23 01.7	3.3	55.9	
03	226 58.3	. .	27.2		140 10.0	9.5	23 05.0	3.1	55.9	
04	241 58.6		28.2		154 38.5	9.5	23 08.1	3.0	55.9	
05	256 58.8		29.1		169 07.0	9.6	23 11.1	3.0	55.8	
06	271 59.0	S	0 30.1		183 35.6	9.5	S23 14.1	2.7	55.8	
07	286 59.2		31.1		198 04.1	9.6	23 16.8	2.7	55.8	
L 08	301 59.4		32.1		212 32.7	9.6	23 19.5	2.5	55.7	
U 09	316 59.6	. .	33.0		227 01.3	9.6	23 22.0	2.4	55.7	
N 10	331 59.9		34.0		241 29.9	9.6	23 24.4	2.3	55.7	
11	347 00.1		35.0		255 58.5	9.6	23 26.7	2.2	55.6	
E 12	2 00.3	S	0 36.0		270 27.1	9.6	S23 28.9	2.0	55.6	
S 13	17 00.5		36.9		284 55.7	9.7	23 30.9	2.0	55.6	
14	32 00.7		37.9		299 24.4	9.7	23 32.9	1.7	55.6	
15	47 00.9	. .	38.9		313 53.1	9.7	23 34.6	1.7	55.5	
16	62 01.2		39.9		328 21.8	9.7	23 36.3	1.6	55.5	
17	77 01.4		40.8		342 50.5	9.7	23 37.9	1.4	55.5	
18	92 01.6	S	0 41.8		357 19.2	9.8	S23 39.3	1.3	55.4	
19	107 01.8		42.8		11 48.0	9.8	23 40.6	1.2	55.4	
20	122 02.0		43.7		26 16.8	9.8	23 41.8	1.0	55.4	
21	137 02.2	. .	44.7		40 45.6	9.8	23 42.8	1.0	55.4	
22	152 02.5		45.7		55 14.4	9.9	23 43.8	0.8	55.3	
23	167 02.7		46.7		69 43.3	9.8	S23 44.6	0.6	55.3	
	SD 16.0		d 1.0		SD	15.6		15.4		15.2

Lat.	Crepúsculo Náutico	Crepúsculo Civil	Orto Sol	Orto Luna 22	Orto Luna 23	Orto Luna 24	Orto Luna 25
°	h m	h m	h m	h m	h m	h m	h m
N 72	03 04	04 35	05 43	▬	▬	▬	▬
N 70	03 24	04 42	05 44	▬	▬	▬	▬
68	03 38	04 49	05 45	14 37	▬	▬	▬
66	03 50	04 54	05 45	13 57	15 49	17 35	18 23
64	04 00	04 58	05 46	13 30	15 05	16 25	17 16
62	04 08	05 02	05 46	13 09	14 36	15 49	16 41
60	04 15	05 05	05 47	12 52	14 14	15 23	16 15
N 58	04 21	05 08	05 47	12 38	13 56	15 03	15 55
56	04 26	05 10	05 47	12 26	13 41	14 46	15 39
54	04 30	05 12	05 47	12 15	13 28	14 32	15 24
52	04 34	05 14	05 48	12 06	13 17	14 20	15 12
50	04 37	05 15	05 48	11 58	13 07	14 09	15 01
45	04 44	05 19	05 48	11 40	12 46	13 46	14 38
N 40	04 50	05 21	05 48	11 25	12 29	13 28	14 20
35	04 54	05 23	05 49	11 13	12 15	13 12	14 04
30	04 57	05 25	05 49	11 03	12 03	12 59	13 51
20	05 01	05 27	05 49	10 44	11 42	12 36	13 28
N 10	05 04	05 28	05 49	10 29	11 23	12 17	13 09
0	05 04	05 28	05 49	10 14	11 06	11 59	12 50
S 10	05 04	05 28	05 49	10 00	10 50	11 40	12 32
20	05 01	05 27	05 49	09 44	10 32	11 21	12 12
30	04 57	05 24	05 48	09 26	10 11	10 59	11 49
35	04 53	05 23	05 48	09 16	09 59	10 46	11 36
40	04 49	05 21	05 48	09 05	09 45	10 30	11 21
45	04 44	05 18	05 47	08 51	09 29	10 13	11 02
S 50	04 37	05 15	05 47	08 34	09 09	09 50	10 39
52	04 33	05 13	05 46	08 27	08 59	09 40	10 29
54	04 29	05 11	05 46	08 18	08 49	09 28	10 16
56	04 25	05 09	05 46	08 08	08 37	09 14	10 02
58	04 19	05 06	05 45	07 57	08 23	08 58	09 45
S 60	04 14	05 03	05 45	07 45	08 07	08 39	09 25

Lat.	Ocaso Sol	Crepúsculo Civil	Crepúsculo Náutico	Ocaso Luna 22	Ocaso Luna 23	Ocaso Luna 24	Ocaso Luna 25
°	h m	h m	h m	h m	h m	h m	h m
N 72	17 59	19 07	20 36	▬	▬	▬	▬
N 70	17 59	19 00	20 17	▬	▬	▬	▬
68	17 58	18 54	20 03	18 04	▬	▬	▬
66	17 58	18 49	19 52	18 45	18 43	18 45	19 44
64	17 57	18 45	19 42	19 13	19 27	19 56	20 51
62	17 57	18 41	19 35	19 34	19 56	20 32	21 26
60	17 57	18 38	19 28	19 52	20 18	20 57	21 51
N 58	17 57	18 36	19 22	20 07	20 37	21 18	22 11
56	17 56	18 33	19 17	20 19	20 52	21 34	22 28
54	17 56	18 31	19 13	20 30	21 05	21 49	22 42
52	17 56	18 30	19 09	20 40	21 17	22 01	22 54
50	17 56	18 28	19 06	20 49	21 27	22 12	23 05
45	17 56	18 25	18 59	21 08	21 48	22 35	23 28
N 40	17 56	18 23	18 54	21 23	22 06	22 54	23 46
35	17 55	18 21	18 50	21 36	22 20	23 09	24 01
30	17 55	18 19	18 47	21 47	22 33	23 22	24 14
20	17 55	18 17	18 43	22 06	22 55	23 45	24 37
N 10	17 55	18 16	18 41	22 23	23 14	24 05	00 05
0	17 56	18 16	18 40	22 39	23 32	24 24	00 24
S 10	17 56	18 17	18 41	22 55	23 49	24 42	00 42
20	17 56	18 18	18 44	23 12	24 08	00 08	01 02
30	17 57	18 21	18 49	23 32	24 30	00 30	01 24
35	17 57	18 22	18 52	23 43	24 43	00 43	01 38
40	17 58	18 25	18 56	23 56	24 58	00 58	01 53
45	17 58	18 28	19 02	24 12	00 12	01 15	02 12
S 50	17 59	18 31	19 09	24 31	00 31	01 37	02 34
52	17 59	18 33	19 13	24 40	00 40	01 48	02 45
54	18 00	18 35	19 17	24 51	00 51	01 59	02 58
56	18 00	18 37	19 22	25 02	01 02	02 13	03 12
58	18 01	18 40	19 27	25 16	01 16	02 29	03 29
S 60	18 01	18 43	19 33	00 05	01 31	02 48	03 49

Día	SOL E.T. (+) 00h	SOL E.T. (+) 12h	SOL Pas. Mer.	LUNA Pas. Sup.	LUNA Mer. Inf.	LUNA Edad	LUNA Fase
d	m s	m s	h m	h m	h m	d	%
22	07 08	07 19	11 53	16 27	04 01	05	31
23	07 29	07 40	11 52	17 19	04 53	06	41
24	07 50	08 01	11 52	18 11	05 45	07	51

T.U.	ARIES	VENUS −3.9		MARTE −0.4		JUPITER −2.2		SATURNO +0.0	
	A.H.G.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
28 00	6 50.1	206 19.4	N 9 28.0	84 51.9	S25 57.3	261 59.3	N22 33.5	292 55.9	N20 46.7
01	21 52.6	221 19.0	26.9	99 52.7	57.1	277 01.5	33.5	307 58.3	46.7
02	36 55.0	236 18.6	25.8	114 53.5	56.9	292 03.7	33.4	323 00.8	46.7
03	51 57.5	251 18.1	24.7	129 54.3	56.7	307 05.8	33.4	338 03.3	46.6
04	67 00.0	266 17.7	23.7	144 55.1	56.5	322 08.0	33.4	353 05.7	46.6
05	82 02.4	281 17.2	22.6	159 55.9	56.3	337 10.2	33.4	8 08.2	46.6
06	97 04.9	296 16.8	N 9 21.5	174 56.7	S25 56.1	352 12.4	N22 33.3	23 10.7	N20 46.6
07	112 07.4	311 16.3	20.4	189 57.5	56.0	7 14.5	33.3	38 13.1	46.6
V 08	127 09.8	326 15.9	19.3	204 58.3	55.8	22 16.7	33.3	53 15.6	46.6
I 09	142 12.3	341 15.5	18.3	219 59.1	55.6	37 18.9	33.3	68 18.1	46.6
E 10	157 14.7	356 15.0	17.2	234 59.9	55.4	52 21.1	33.2	83 20.6	46.6
R 11	172 17.2	11 14.6	16.1	250 00.7	55.2	67 23.2	33.2	98 23.0	46.6
N 12	187 19.7	26 14.1	N 9 15.0	265 01.5	S25 55.0	82 25.4	N22 33.2	113 25.5	N20 46.6
E 13	202 22.1	41 13.7	13.9	280 02.3	54.8	97 27.6	33.2	128 28.0	46.6
S 14	217 24.6	56 13.3	12.9	295 03.1	54.6	112 29.8	33.1	143 30.4	46.6
15	232 27.1	71 12.8	11.8	310 03.9	54.4	127 32.0	33.1	158 32.9	46.6
16	247 29.5	86 12.4	10.7	325 04.7	54.2	142 34.1	33.1	173 35.4	46.6
17	262 32.0	101 11.9	09.6	340 05.5	54.1	157 36.3	33.1	188 37.8	46.6
18	277 34.5	116 11.5	N 9 08.5	355 06.3	S25 53.9	172 38.5	N22 33.1	203 40.3	N20 46.6
19	292 36.9	131 11.1	07.4	10 07.1	53.7	187 40.7	33.0	218 42.8	46.6
20	307 39.4	146 10.6	06.3	25 07.9	53.5	202 42.9	33.0	233 45.3	46.5
21	322 41.9	161 10.2	05.3	40 08.7	53.3	217 45.0	33.0	248 47.7	46.5
22	337 44.3	176 09.8	04.2	55 09.5	53.1	232 47.2	33.0	263 50.2	46.5
23	352 46.8	191 09.3	03.1	70 10.3	52.9	247 49.4	32.9	278 52.7	46.5
29 00	7 49.2	206 08.9	N 9 02.0	85 11.1	S25 52.7	262 51.6	N22 32.9	293 55.2	N20 46.5
01	22 51.7	221 08.4	9 00.9	100 11.9	52.5	277 53.8	32.9	308 57.6	46.5
02	37 54.2	236 08.0	8 59.8	115 12.7	52.3	292 55.9	32.9	324 00.1	46.5
03	52 56.6	251 07.6	58.7	130 13.5	52.1	307 58.1	32.8	339 02.6	46.5
04	67 59.1	266 07.1	57.6	145 14.3	51.9	323 00.3	32.8	354 05.1	46.5
05	83 01.6	281 06.7	56.5	160 15.1	51.7	338 02.5	32.8	9 07.5	46.5
06	98 04.0	296 06.3	N 8 55.4	175 15.9	S25 51.5	353 04.7	N22 32.8	24 10.0	N20 46.5
S 07	113 06.5	311 05.8	54.4	190 16.7	51.3	8 06.8	32.7	39 12.5	46.5
08	128 09.0	326 05.4	53.3	205 17.4	51.1	23 09.0	32.7	54 14.9	46.5
A 09	143 11.4	341 05.0	52.2	220 18.2	50.9	38 11.2	32.7	69 17.4	46.5
10	158 13.9	356 04.5	51.1	235 19.0	50.7	53 13.4	32.7	84 19.9	46.5
B 11	173 16.3	11 04.1	50.0	250 19.8	50.5	68 15.6	32.7	99 22.4	46.5
A 12	188 18.8	26 03.7	N 8 48.9	265 20.6	S25 50.3	83 17.8	N22 32.6	114 24.9	N20 46.5
13	203 21.3	41 03.2	47.8	280 21.4	50.1	98 19.9	32.6	129 27.3	46.4
D 14	218 23.7	56 02.8	46.7	295 22.2	49.9	113 22.1	32.6	144 29.8	46.4
15	233 26.2	71 02.3	45.6	310 23.0	49.7	128 24.3	32.6	159 32.3	46.4
O 16	248 28.7	86 01.9	44.5	325 23.8	49.5	143 26.5	32.5	174 34.8	46.4
17	263 31.1	101 01.5	43.4	340 24.6	49.3	158 28.7	32.5	189 37.2	46.4
18	278 33.6	116 01.0	N 8 42.3	355 25.4	S25 49.1	173 30.9	N22 32.5	204 39.7	N20 46.4
19	293 36.1	131 00.6	41.2	10 26.2	48.9	188 33.1	32.5	219 42.2	46.4
20	308 38.5	146 00.2	40.1	25 26.9	48.7	203 35.2	32.4	234 44.7	46.4
21	323 41.0	160 59.7	39.0	40 27.7	48.5	218 37.4	32.4	249 47.1	46.4
22	338 43.5	175 59.3	37.9	55 28.5	48.3	233 39.6	32.4	264 49.6	46.4
23	353 45.9	190 58.9	36.8	70 29.3	48.1	248 41.8	32.4	279 52.1	46.4
30 00	8 48.4	205 58.5	N 8 35.7	85 30.1	S25 47.9	263 44.0	N22 32.4	294 54.6	N20 46.4
01	23 50.8	220 58.0	34.6	100 30.9	47.7	278 46.2	32.3	309 57.1	46.4
02	38 53.3	235 57.6	33.5	115 31.7	47.5	293 48.4	32.3	324 59.5	46.4
03	53 55.8	250 57.2	32.4	130 32.5	47.3	308 50.6	32.3	340 02.0	46.4
04	68 58.2	265 56.7	31.3	145 33.3	47.1	323 52.7	32.3	355 04.5	46.3
05	84 00.7	280 56.3	30.2	160 34.0	46.9	338 54.9	32.2	10 07.0	46.3
06	99 03.2	295 55.9	N 8 29.1	175 34.8	S25 46.7	353 57.1	N22 32.2	25 09.4	N20 46.3
07	114 05.6	310 55.4	28.0	190 35.6	46.5	8 59.3	32.2	40 11.9	46.3
D 08	129 08.1	325 55.0	26.9	205 36.4	46.3	24 01.5	32.2	55 14.4	46.3
O 09	144 10.6	340 54.6	25.8	220 37.2	46.1	39 03.7	32.1	70 16.9	46.3
M 10	159 13.0	355 54.1	24.7	235 38.0	45.9	54 05.9	32.1	85 19.4	46.3
I 11	174 15.5	10 53.7	23.6	250 38.8	45.7	69 08.1	32.1	100 21.8	46.3
N 12	189 17.9	25 53.3	N 8 22.5	265 39.5	S25 45.5	84 10.3	N22 32.1	115 24.3	N20 46.3
G 13	204 20.4	40 52.9	21.4	280 40.3	45.3	99 12.5	32.1	130 26.8	46.3
O 14	219 22.9	55 52.4	20.3	295 41.1	45.1	114 14.7	32.0	145 29.3	46.3
15	234 25.3	70 52.0	19.2	310 41.9	44.9	129 16.8	32.0	160 31.8	46.3
16	249 27.8	85 51.6	18.1	325 42.7	44.7	144 19.0	32.0	175 34.2	46.3
17	264 30.3	100 51.1	17.0	340 43.5	44.5	159 21.2	32.0	190 36.7	46.3
18	279 32.7	115 50.7	N 8 15.9	355 44.2	S25 44.2	174 23.4	N22 31.9	205 39.2	N20 46.3
19	294 35.2	130 50.3	14.8	10 45.0	44.0	189 25.6	31.9	220 41.7	46.2
20	309 37.7	145 49.9	13.6	25 45.8	43.8	204 27.8	31.9	235 44.2	46.2
21	324 40.1	160 49.4	12.5	40 46.6	43.6	219 30.0	31.9	250 46.7	46.2
22	339 42.6	175 49.0	11.4	55 47.4	43.4	234 32.2	31.8	265 49.1	46.2
23	354 45.1	190 48.6	10.3	70 48.1	43.2	249 34.4	31.8	280 51.6	46.2
Pas. Mer.	h m 23 24.9	v −0.4	d 1.1	v 0.8	d 0.2	v 2.2	d 0.0	v 2.5	d 0.0

ESTRELLAS

Nombre	A.H.S.	Dec.
	° ′	° ′
Acamar	315 24.9	S40 17.7
Achernar	335 32.9	S57 13.6
Acrux	173 20.5	S63 06.4
Adhara	255 19.8	S28 58.2
Aldebaran	290 59.8	N16 30.8
Alioth	166 29.2	N55 57.2
Alkaid	153 06.5	N49 18.5
Al Na'ir	27 54.8	S46 57.3
Alnilam	275 55.7	S 1 11.9
Alphard	218 05.4	S 8 39.7
Alphecca	126 19.0	N26 42.8
Alpheratz	357 52.7	N29 06.0
Altair	62 17.1	N 8 52.5
Ankaa	353 24.3	S42 17.8
Antares	112 37.8	S26 26.1
Arcturus	146 04.4	N19 10.7
Atria	107 48.2	S69 02.0
Avior	234 22.2	S59 30.5
Bellatrix	278 41.8	N 6 21.2
Betelgeuse	271 11.2	N 7 24.5
Canopus	264 00.2	S52 41.5
Capella	280 48.0	N45 59.8
Deneb	49 37.6	N45 17.4
Denebola	182 43.4	N14 34.0
Diphda	349 04.8	S17 58.6
Dubhe	194 03.4	N61 44.6
Elnath	278 24.2	N28 36.5
Eltanin	90 50.5	N51 29.6
Enif	33 55.9	N 9 53.0
Fomalhaut	15 33.7	S29 36.8
Gacrux	172 11.9	S57 07.2
Gienah	176 02.2	S17 32.8
Hadar	149 01.7	S60 22.8
Hamal	328 10.9	N23 28.2
Kaus Aust.	83 56.0	S34 23.1
Kochab	137 20.4	N74 09.2
Markab	13 47.2	N15 12.9
Menkar	314 24.5	N 4 05.8
Menkent	148 18.9	S36 22.6
Miaplacidus	221 42.4	S69 43.1
Mirfak	308 53.3	N49 51.9
Nunki	76 09.7	S26 17.7
Peacock	53 33.4	S56 44.0
Pollux	243 39.1	N28 01.3
Procyon	245 09.5	N 5 13.4
Rasalhague	96 15.1	N12 33.7
Regulus	207 53.6	N11 57.7
Rigel	281 20.8	S 8 11.8
Rigil Kent.	140 05.1	S60 50.5
Sabik	102 23.2	S15 43.5
Schedar	349 50.6	N56 32.8
Shaula	96 34.5	S37 06.4
Sirius	258 41.9	S16 42.8
Spica	158 41.3	S11 10.0
Suhail	222 59.6	S43 26.0
Vega	80 45.2	N38 47.4
Zuben'ubi	137 15.9	S16 02.8

	A.H.S.	Pas. Mer.
	° ′	h m
Venus	198 19.6	10 16
Marte	77 21.8	18 18
Júpiter	255 02.3	6 28
Saturno	286 05.9	4 24

T.U.	SOL A.H.G.	SOL Dec.	LUNA A.H.G.	v	LUNA Dec.	d	P.H.
d h	° ′	° ′	° ′	′	° ′	′	′
28 00	182 18.3	S 1 57.7	48 30.6	12.9	S19 40.4	7.0	54.1
01	197 18.5	58.7	63 02.5	13.0	19 33.4	7.1	54.1
02	212 18.7	1 59.7	77 34.5	13.1	19 26.3	7.2	54.1
03	227 18.9	2 00.7	92 06.6	13.1	19 19.1	7.3	54.1
04	242 19.1	01.6	106 38.7	13.1	19 11.8	7.3	54.1
05	257 19.3	02.6	121 10.8	13.2	19 04.5	7.5	54.1
06	272 19.5	S 2 03.6	135 43.0	13.3	S18 57.0	7.5	54.1
07	287 19.8	04.5	150 15.3	13.2	18 49.5	7.6	54.1
V 08	302 20.0	05.5	164 47.5	13.4	18 41.9	7.7	54.1
I 09	317 20.2	. . 06.5	179 19.9	13.4	18 34.2	7.8	54.1
E 10	332 20.4	07.5	193 52.3	13.4	18 26.4	7.8	54.1
R 11	347 20.6	08.4	208 24.7	13.5	18 18.6	7.9	54.1
12	2 20.8	S 2 09.4	222 57.2	13.5	S18 10.7	8.0	54.1
N 13	17 21.0	10.4	237 29.7	13.6	18 02.7	8.1	54.1
E 14	32 21.2	11.4	252 02.3	13.6	17 54.6	8.1	54.1
S 15	47 21.4	. . 12.3	266 34.9	13.7	17 46.5	8.3	54.1
16	62 21.6	13.3	281 07.6	13.7	17 38.2	8.3	54.1
17	77 21.9	14.3	295 40.3	13.7	17 29.9	8.3	54.1
18	92 22.1	S 2 15.2	310 13.0	13.8	S17 21.6	8.5	54.1
19	107 22.3	16.2	324 45.8	13.9	17 13.1	8.5	54.0
20	122 22.5	17.2	339 18.7	13.9	17 04.6	8.6	54.0
21	137 22.7	. . 18.2	353 51.6	13.9	16 56.0	8.7	54.0
22	152 22.9	19.1	8 24.5	14.0	16 47.3	8.7	54.0
23	167 23.1	20.1	22 57.5	14.0	16 38.6	8.8	54.0
29 00	182 23.3	S 2 21.1	37 30.5	14.1	S16 29.8	8.9	54.0
01	197 23.5	22.0	52 03.6	14.1	16 20.9	8.9	54.0
02	212 23.7	23.0	66 36.7	14.2	16 12.0	9.0	54.0
03	227 23.9	. . 24.0	81 09.9	14.2	16 03.0	9.1	54.0
04	242 24.1	25.0	95 43.1	14.2	15 53.9	9.1	54.0
05	257 24.4	25.9	110 16.3	14.3	15 44.8	9.2	54.0
06	272 24.6	S 2 26.9	124 49.6	14.4	S15 35.6	9.3	54.0
07	287 24.8	27.9	139 23.0	14.3	15 26.3	9.4	54.0
S 08	302 25.0	28.8	153 56.3	14.4	15 16.9	9.4	54.0
A 09	317 25.2	. . 29.8	168 29.7	14.5	15 07.5	9.4	54.0
B 10	332 25.4	30.8	183 03.2	14.5	14 58.1	9.6	54.0
A 11	347 25.6	31.8	197 36.7	14.5	14 48.5	9.5	54.0
12	2 25.8	S 2 32.7	212 10.2	14.6	S14 39.0	9.7	54.0
D 13	17 26.0	33.7	226 43.8	14.6	14 29.3	9.7	54.0
O 14	32 26.2	34.7	241 17.4	14.6	14 19.6	9.8	54.0
15	47 26.4	. . 35.6	255 51.0	14.7	14 09.8	9.8	54.0
16	62 26.6	36.6	270 24.7	14.7	14 00.0	9.9	54.0
17	77 26.8	37.6	284 58.4	14.7	13 50.1	9.9	54.0
18	92 27.0	S 2 38.6	299 32.1	14.8	S13 40.2	10.0	54.1
19	107 27.3	39.5	314 05.9	14.8	13 30.2	10.1	54.1
20	122 27.5	40.5	328 39.7	14.9	13 20.1	10.1	54.1
21	137 27.7	. . 41.5	343 13.6	14.9	13 10.0	10.2	54.1
22	152 27.9	42.4	357 47.5	14.9	12 59.8	10.2	54.1
23	167 28.1	43.4	12 21.4	15.0	12 49.6	10.3	54.1
30 00	182 28.3	S 2 44.4	26 55.4	15.0	S12 39.3	10.3	54.1
01	197 28.5	45.4	41 29.4	15.0	12 29.0	10.4	54.1
02	212 28.7	46.3	56 03.4	15.0	12 18.6	10.4	54.1
03	227 28.9	. . 47.3	70 37.4	15.1	12 08.2	10.5	54.1
04	242 29.1	48.3	85 11.5	15.1	11 57.7	10.6	54.1
05	257 29.3	49.2	99 45.6	15.2	11 47.1	10.5	54.1
06	272 29.5	S 2 50.2	114 19.8	15.2	S11 36.6	10.7	54.1
07	287 29.7	51.2	128 54.0	15.2	11 25.9	10.7	54.1
D 08	302 29.9	52.1	143 28.2	15.2	11 15.2	10.7	54.1
O 09	317 30.1	. . 53.1	158 02.4	15.3	11 04.5	10.8	54.1
M 10	332 30.3	54.1	172 36.7	15.2	10 53.7	10.8	54.1
I 11	347 30.5	55.1	187 10.9	15.4	10 42.9	10.9	54.1
12	2 30.8	S 2 56.0	201 45.3	15.3	S10 32.0	10.9	54.1
N 13	17 31.0	57.0	216 19.6	15.4	10 21.1	10.9	54.1
G 14	32 31.2	58.0	230 54.0	15.3	10 10.2	11.0	54.1
O 15	47 31.4	. . 58.9	245 28.3	15.5	9 59.2	11.1	54.1
16	62 31.6	2 59.9	260 02.8	15.4	9 48.1	11.1	54.2
17	77 31.8	3 00.9	274 37.2	15.4	9 37.0	11.1	54.2
18	92 32.0	S 3 01.9	289 11.6	15.5	S 9 25.9	11.2	54.2
19	107 32.2	02.8	303 46.1	15.5	9 14.7	11.2	54.2
20	122 32.4	03.8	318 20.6	15.5	9 03.5	11.2	54.2
21	137 32.6	. . 04.8	332 55.1	15.6	8 52.3	11.3	54.2
22	152 32.8	05.7	347 29.7	15.5	8 41.0	11.3	54.2
23	167 33.0	06.7	2 04.2	15.6	S 8 29.7	11.4	54.2
	SD 16.0	d 1.0	SD 14.7		14.7		14.7

Lat.	Crepúsculo Náutico	Crepúsculo Civil	Orto Sol	Orto Luna 28	Orto Luna 29	Orto Luna 30	Orto Luna 1
°	h m	h m	h m	h m	h m	h m	h m
N 72	03 39	05 02	06 10	20 10	19 16	18 47	18 25
N 70	03 52	05 07	06 08	19 16	18 50	18 33	18 18
68	04 03	05 10	06 06	18 43	18 31	18 21	18 13
66	04 12	05 13	06 04	18 19	18 15	18 12	18 08
64	04 19	05 16	06 03	18 00	18 02	18 04	18 04
62	04 25	05 18	06 02	17 44	17 52	17 57	18 01
60	04 30	05 19	06 01	17 31	17 42	17 51	17 58
N 58	04 35	05 21	06 00	17 20	17 34	17 46	17 55
56	04 38	05 22	05 59	17 10	17 27	17 41	17 53
54	04 42	05 23	05 58	17 01	17 20	17 37	17 51
52	04 44	05 24	05 57	16 53	17 14	17 33	17 49
50	04 47	05 25	05 57	16 46	17 09	17 29	17 47
45	04 52	05 26	05 55	16 31	16 58	17 21	17 43
N 40	04 56	05 27	05 54	16 18	16 48	17 15	17 40
35	04 59	05 28	05 53	16 08	16 40	17 09	17 37
30	05 01	05 28	05 52	15 58	16 33	17 05	17 35
20	05 03	05 28	05 50	15 42	16 20	16 56	17 30
N 10	05 03	05 28	05 49	15 28	16 09	16 48	17 27
0	05 02	05 26	05 47	15 14	15 59	16 41	17 23
S 10	05 00	05 24	05 45	15 01	15 48	16 34	17 20
20	04 56	05 21	05 43	14 47	15 37	16 27	17 16
30	04 49	05 17	05 41	14 30	15 24	16 18	17 11
35	04 44	05 14	05 39	14 21	15 17	16 13	17 09
40	04 39	05 11	05 38	14 10	15 09	16 07	17 06
45	04 32	05 06	05 36	13 57	14 59	16 01	17 03
S 50	04 23	05 01	05 34	13 41	14 47	15 53	16 59
52	04 18	04 59	05 32	13 34	14 41	15 49	16 57
54	04 13	04 56	05 31	13 25	14 35	15 45	16 55
56	04 07	04 52	05 30	13 16	14 28	15 40	16 53
58	04 01	04 49	05 28	13 05	14 20	15 35	16 50
S 60	03 53	04 45	05 27	12 53	14 11	15 29	16 47

Lat.	Ocaso Sol	Crepúsculo Civil	Crepúsculo Náutico	Ocaso Luna 28	Ocaso Luna 29	Ocaso Luna 30	Ocaso Luna 1
°	h m	h m	h m	h m	h m	h m	h m
N 72	17 29	18 35	19 58	22 57	25 22	01 22	03 20
N 70	17 31	18 31	19 45	23 49	25 46	01 46	03 32
68	17 33	18 28	19 35	24 21	00 21	02 04	03 41
66	17 35	18 25	19 26	24 45	00 45	02 18	03 49
64	17 36	18 23	19 19	25 03	01 03	02 30	03 56
62	17 37	18 21	19 14	25 18	01 18	02 40	04 02
60	17 39	18 20	19 09	00 13	01 30	02 49	04 07
N 58	17 40	18 19	19 04	00 27	01 41	02 56	04 11
56	17 41	18 17	19 01	00 39	01 50	03 03	04 15
54	17 41	18 16	18 58	00 50	01 59	03 08	04 18
52	17 42	18 16	18 55	00 59	02 06	03 14	04 22
50	17 43	18 15	18 52	01 07	02 12	03 18	04 24
45	17 44	18 14	18 48	01 25	02 27	03 28	04 30
N 40	17 46	18 13	18 44	01 39	02 38	03 37	04 36
35	17 47	18 12	18 41	01 52	02 48	03 44	04 40
30	17 48	18 12	18 40	02 02	02 57	03 50	04 44
20	17 50	18 12	18 37	02 20	03 11	04 01	04 50
N 10	17 52	18 13	18 37	02 36	03 24	04 11	04 56
0	17 54	18 14	18 38	02 51	03 36	04 19	05 02
S 10	17 55	18 16	18 41	03 06	03 48	04 28	05 07
20	17 58	18 20	18 45	03 21	04 01	04 37	05 13
30	18 00	18 24	18 52	03 39	04 15	04 48	05 19
35	18 02	18 27	18 57	03 49	04 23	04 54	05 23
40	18 03	18 31	19 03	04 01	04 33	05 01	05 27
45	18 06	18 35	19 10	04 15	04 44	05 09	05 31
S 50	18 08	18 41	19 19	04 31	04 57	05 18	05 37
52	18 09	18 43	19 24	04 39	05 03	05 23	05 40
54	18 10	18 46	19 29	04 48	05 10	05 27	05 43
56	18 12	18 50	19 35	04 58	05 17	05 33	05 46
58	18 13	18 53	19 42	05 09	05 26	05 39	05 49
S 60	18 15	18 58	19 49	05 22	05 35	05 45	05 53

Día	SOL E.T. (+) 00h	SOL E.T. (+) 12h	SOL Pas. Mer.	LUNA Pas. Sup.	LUNA Mer. Inf.	LUNA Edad	LUNA Fase
d	m s	m s	h m	h m	h m	d %	
28	09 13	09 23	11 51	21 25	09 03	11 86	
29	09 33	09 43	11 50	22 09	09 47	12 91	
30	09 53	10 03	11 50	22 51	10 30	13 96	

T.U.	ARIES	VENUS −3.9		MARTE −0.3		JUPITER −2.2		SATURNO −0.1	
d h	A.H.G.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.
	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
1 00	9 47.5	205 48.1	N 8 09.2	85 48.9	S25 43.0	264 36.6	N22 31.8	295 54.1	N20 46.2
01	24 50.0	220 47.7	08.1	100 49.7	42.8	279 38.8	31.8	310 56.6	46.2
02	39 52.4	235 47.3	07.0	115 50.5	42.6	294 41.0	31.8	325 59.1	46.2
03	54 54.9	250 46.9 . .	05.9	130 51.3 . .	42.4	309 43.2 . .	31.7	341 01.6 . .	46.2
04	69 57.4	265 46.4	04.8	145 52.0	42.2	324 45.4	31.7	356 04.0	46.2
05	84 59.8	280 46.0	03.7	160 52.8	41.9	339 47.6	31.7	11 06.5	46.2
06	100 02.3	295 45.6	N 8 02.5	175 53.6	S25 41.7	354 49.8	N22 31.7	26 09.0	N20 46.2
07	115 04.8	310 45.2	01.4	190 54.4	41.5	9 52.0	31.6	41 11.5	46.2
08	130 07.2	325 44.7	8 00.3	205 55.2	41.3	24 54.2	31.6	56 14.0	46.2
L 09	145 09.7	340 44.3	7 59.2	220 55.9 . .	41.1	39 56.4 . .	31.6	71 16.5 . .	46.1
U 10	160 12.2	355 43.9	58.1	235 56.7	40.9	54 58.6	31.6	86 18.9	46.1
11	175 14.6	10 43.5	57.0	250 57.5	40.7	70 00.8	31.6	101 21.4	46.1
N 12	190 17.1	25 43.0	N 7 55.9	265 58.3	S25 40.5	85 02.9	N22 31.5	116 23.9	N20 46.1
E 13	205 19.6	40 42.6	54.7	280 59.1	40.2	100 05.1	31.5	131 26.4	46.1
14	220 22.0	55 42.2	53.6	295 59.8	40.0	115 07.3	31.5	146 28.9	46.1
S 15	235 24.5	70 41.8 . .	52.5	311 00.6 . .	39.8	130 09.5 . .	31.5	161 31.4 . .	46.1
16	250 26.9	85 41.3	51.4	326 01.4	39.6	145 11.7	31.4	176 33.9	46.1
17	265 29.4	100 40.9	50.3	341 02.2	39.4	160 13.9	31.4	191 36.3	46.1
18	280 31.9	115 40.5	N 7 49.2	356 02.9	S25 39.2	175 16.1	N22 31.4	206 38.8	N20 46.1
19	295 34.3	130 40.1	48.0	11 03.7	38.9	190 18.3	31.4	221 41.3	46.1
20	310 36.8	145 39.7	46.9	26 04.5	38.7	205 20.5	31.4	236 43.8	46.1
21	325 39.3	160 39.2 . .	45.8	41 05.3 . .	38.5	220 22.7 . .	31.3	251 46.3 . .	46.1
22	340 41.7	175 38.8	44.7	56 06.0	38.3	235 24.9	31.3	266 48.8	46.1
23	355 44.2	190 38.4	43.6	71 06.8	38.1	250 27.2	31.3	281 51.3	46.0
2 00	10 46.7	205 38.0	N 7 42.4	86 07.6	S25 37.9	265 29.4	N22 31.3	296 53.8	N20 46.0
01	25 49.1	220 37.5	41.3	101 08.4	37.6	280 31.6	31.2	311 56.2	46.0
02	40 51.6	235 37.1	40.2	116 09.1	37.4	295 33.8	31.2	326 58.7	46.0
03	55 54.0	250 36.7 . .	39.1	131 09.9 . .	37.2	310 36.0 . .	31.2	342 01.2 . .	46.0
04	70 56.5	265 36.3	38.0	146 10.7	37.0	325 38.2	31.2	357 03.7	46.0
05	85 59.0	280 35.9	36.8	161 11.4	36.8	340 40.4	31.2	12 06.2	46.0
06	101 01.4	295 35.4	N 7 35.7	176 12.2	S25 36.5	355 42.6	N22 31.1	27 08.7	N20 46.0
07	116 03.9	310 35.0	34.6	191 13.0	36.3	10 44.8	31.1	42 11.2	46.0
M 08	131 06.4	325 34.6	33.5	206 13.8	36.1	25 47.0	31.1	57 13.7	46.0
A 09	146 08.8	340 34.2 . .	32.3	221 14.5 . .	35.9	40 49.2 . .	31.1	72 16.1 . .	46.0
R 10	161 11.3	355 33.8	31.2	236 15.3	35.7	55 51.4	31.1	87 18.6	46.0
11	176 13.8	10 33.3	30.1	251 16.1	35.4	70 53.6	31.0	102 21.1	46.0
T 12	191 16.2	25 32.9	N 7 29.0	266 16.8	S25 35.2	85 55.8	N22 31.0	117 23.6	N20 45.9
E 13	206 18.7	40 32.5	27.8	281 17.6	35.0	100 58.0	31.0	132 26.1	45.9
14	221 21.2	55 32.1	26.7	296 18.4	34.8	116 00.2	31.0	147 28.6	45.9
S 15	236 23.6	70 31.7 . .	25.6	311 19.2 . .	34.6	131 02.4 . .	30.9	162 31.1 . .	45.9
16	251 26.1	85 31.2	24.5	326 19.9	34.3	146 04.6	30.9	177 33.6	45.9
17	266 28.5	100 30.8	23.3	341 20.7	34.1	161 06.8	30.9	192 36.1	45.9
18	281 31.0	115 30.4	N 7 22.2	356 21.5	S25 33.9	176 09.0	N22 30.9	207 38.6	N20 45.9
19	296 33.5	130 30.0	21.1	11 22.2	33.7	191 11.2	30.9	222 41.1	45.9
20	311 35.9	145 29.6	20.0	26 23.0	33.4	206 13.5	30.8	237 43.5	45.9
21	326 38.4	160 29.1 . .	18.8	41 23.8 . .	33.2	221 15.7 . .	30.8	252 46.0 . .	45.9
22	341 40.9	175 28.7	17.7	56 24.5	33.0	236 17.9	30.8	267 48.5	45.9
23	356 43.3	190 28.3	16.6	71 25.3	32.8	251 20.1	30.8	282 51.0	45.9
3 00	11 45.8	205 27.9	N 7 15.4	86 26.1	S25 32.5	266 22.3	N22 30.7	297 53.5	N20 45.9
01	26 48.3	220 27.5	14.3	101 26.8	32.3	281 24.5	30.7	312 56.0	45.8
02	41 50.7	235 27.1	13.2	116 27.6	32.1	296 26.7	30.7	327 58.5	45.8
03	56 53.2	250 26.6 . .	12.0	131 28.4 . .	31.9	311 28.9 . .	30.7	343 01.0 . .	45.8
04	71 55.6	265 26.2	10.9	146 29.1	31.6	326 31.1	30.7	358 03.5	45.8
05	86 58.1	280 25.8	09.8	161 29.9	31.4	341 33.3	30.6	13 06.0	45.8
06	102 00.6	295 25.4	N 7 08.7	176 30.7	S25 31.2	356 35.6	N22 30.6	28 08.5	N20 45.8
M 07	117 03.0	310 25.0	07.5	191 31.4	30.9	11 37.8	30.6	43 11.0	45.8
I 08	132 05.5	325 24.6	06.4	206 32.2	30.7	26 40.0	30.6	58 13.5	45.8
E 09	147 08.0	340 24.1 . .	05.3	221 32.9 . .	30.5	41 42.2 . .	30.6	73 16.0 . .	45.8
R 10	162 10.4	355 23.7	04.1	236 33.7	30.3	56 44.4	30.5	88 18.4	45.8
C 11	177 12.9	10 23.3	03.0	251 34.5	30.0	71 46.6	30.5	103 20.9	45.8
O 12	192 15.4	25 22.9	N 7 01.9	266 35.2	S25 29.8	86 48.8	N22 30.5	118 23.4	N20 45.8
L 13	207 17.8	40 22.5	7 00.7	281 36.0	29.6	101 51.0	30.5	133 25.9	45.8
E 14	222 20.3	55 22.1	6 59.6	296 36.8	29.3	116 53.2	30.5	148 28.4	45.7
S 15	237 22.8	70 21.6 . .	58.4	311 37.5 . .	29.1	131 55.5 . .	30.4	163 30.9 . .	45.7
16	252 25.2	85 21.2	57.3	326 38.3	28.9	146 57.7	30.4	178 33.4	45.7
17	267 27.7	100 20.8	56.2	341 39.1	28.7	161 59.9	30.4	193 35.9	45.7
18	282 30.1	115 20.4	N 6 55.0	356 39.8	S25 28.4	177 02.1	N22 30.4	208 38.4	N20 45.7
19	297 32.6	130 20.0	53.9	11 40.6	28.2	192 04.3	30.3	223 40.9	45.7
20	312 35.1	145 19.6	52.8	26 41.3	28.0	207 06.5	30.3	238 43.4	45.7
21	327 37.5	160 19.2 . .	51.6	41 42.1 . .	27.7	222 08.8 . .	30.3	253 45.9 . .	45.7
22	342 40.0	175 18.7	50.5	56 42.9	27.5	237 11.0	30.3	268 48.4	45.7
23	357 42.5	190 18.3	49.3	71 43.6	27.3	252 13.2	30.3	283 50.9	45.7
Pas. Mer.	h m 23 13.1	v −0.4	d 1.1	v 0.8	d 0.2	v 2.2	d 0.0	v 2.5	d 0.0

ESTRELLAS		
Nombre	A.H.S.	Dec.
	° ′	° ′
Acamar	315 24.9	S40 17.7
Achernar	335 32.9	S57 13.6
Acrux	173 20.5	S63 06.3
Adhara	255 19.8	S28 58.2
Aldebaran	290 59.8	N16 30.8
Alioth	166 29.2	N55 57.2
Alkaid	153 06.5	N49 18.5
Al Na'ir	27 54.8	S46 57.3
Alnilam	275 55.6	S 1 11.9
Alphard	218 05.4	S 8 39.7
Alphecca	126 19.0	N26 42.8
Alpheratz	357 52.7	N29 06.0
Altair	62 17.1	N 8 52.5
Ankaa	353 24.3	S42 17.8
Antares	112 37.8	S26 26.1
Arcturus	146 04.4	N19 10.7
Atria	107 48.2	S69 02.0
Avior	234 22.1	S59 30.5
Bellatrix	278 41.8	N 6 21.2
Betelgeuse	271 11.2	N 7 24.5
Canopus	264 00.2	S52 41.5
Capella	280 47.9	N45 59.8
Deneb	49 37.6	N45 17.4
Denebola	182 43.4	N14 34.0
Diphda	349 04.8	S17 58.6
Dubhe	194 03.4	N61 44.5
Elnath	278 24.2	N28 36.5
Eltanin	90 50.5	N51 29.6
Enif	33 56.0	N 9 53.1
Fomalhaut	15 33.8	S29 36.6
Gacrux	172 11.9	S57 07.2
Gienah	176 02.2	S17 32.3
Hadar	149 01.8	S60 22.8
Hamal	328 10.9	N23 28.2
Kaus Aust.	83 56.1	S34 23.1
Kochab	137 20.4	N74 09.2
Markab	13 47.2	N15 12.9
Menkar	314 24.5	N 4 05.8
Menkent	148 18.9	S36 22.6
Miaplacidus	221 42.4	S69 43.1
Mirfak	308 53.3	N49 51.9
Nunki	76 09.7	S26 17.7
Peacock	53 33.4	S56 44.0
Pollux	243 39.1	N28 01.3
Procyon	245 09.4	N 5 13.4
Rasalhague	96 15.1	N12 33.7
Regulus	207 53.6	N11 57.7
Rigel	281 20.8	S 8 11.8
Rigil Kent.	140 05.2	S60 50.5
Sabik	102 23.3	S15 43.5
Schedar	349 50.6	N56 32.8
Shaula	96 34.6	S37 06.4
Sirius	258 41.9	S16 42.8
Spica	158 41.3	S11 10.0
Suhail	222 59.5	S43 26.0
Vega	80 45.2	N38 47.4
Zuben'ubi	137 15.9	S16 02.8

	A.H.S.	Pas. Mer.
	° ′	h m
Venus	194 51.3	10 18
Marte	75 20.9	18 15
Júpiter	254 42.7	6 17
Saturno	286 07.1	4 12

T.U.	SOL				LUNA						
	A.H.G.		Dec.		A.H.G.	v	Dec.		d	P.H.	
d h	°	′	°	′	°	′	°	′	′	′	
1 00	182	33.2	S 3	07.7	16	38.8	15.6	S 8	18.3	11.4	54.2
01	197	33.4		08.6	31	13.4	15.6	8	06.9	11.4	54.2
02	212	33.6		09.6	45	48.0	15.6	7	55.5	11.5	54.2
03	227	33.8	. .	10.6	60	22.6	15.7	7	44.0	11.5	54.2
04	242	34.0		11.5	74	57.3	15.6	7	32.5	11.5	54.2
05	257	34.2		12.5	89	31.9	15.7	7	21.0	11.6	54.2
06	272	34.4	S 3	13.5	104	06.6	15.7	S 7	09.4	11.6	54.3
07	287	34.6		14.5	118	41.3	15.7	6	57.8	11.6	54.3
L 08	302	34.8		15.4	133	16.0	15.7	6	46.2	11.7	54.3
09	317	35.0	. .	16.4	147	50.7	15.7	6	34.5	11.7	54.3
U 10	332	35.2		17.4	162	25.4	15.8	6	22.8	11.7	54.3
11	347	35.4		18.3	177	00.2	15.7	6	11.1	11.7	54.3
N 12	2	35.6	S 3	19.3	191	34.9	15.8	S 5	59.4	11.8	54.3
E 13	17	35.8		20.3	206	09.7	15.8	5	47.6	11.8	54.3
14	32	36.0		21.2	220	44.5	15.7	5	35.8	11.9	54.3
S 15	47	36.2	. .	22.2	235	19.2	15.8	5	23.9	11.8	54.3
16	62	36.4		23.2	249	54.0	15.8	5	12.1	11.9	54.3
17	77	36.6		24.1	264	28.8	15.8	5	00.2	11.9	54.4
18	92	36.8	S 3	25.1	279	03.6	15.8	S 4	48.3	12.0	54.4
19	107	37.0		26.1	293	38.4	15.8	4	36.3	11.9	54.4
20	122	37.2		27.0	308	13.2	15.8	4	24.4	12.0	54.4
21	137	37.4	. .	28.0	322	48.0	15.8	4	12.4	12.0	54.4
22	152	37.6		29.0	337	22.8	15.8	4	00.4	12.0	54.4
23	167	37.8		30.0	351	57.6	15.8	3	48.4	12.1	54.4
2 00	182	38.0	S 3	30.9	6	32.4	15.8	S 3	36.3	12.0	54.4
01	197	38.2		31.9	21	07.2	15.8	3	24.3	12.1	54.4
02	212	38.4		32.9	35	42.0	15.9	3	12.2	12.1	54.5
03	227	38.6	. .	33.8	50	16.9	15.8	3	00.1	12.1	54.5
04	242	38.8		34.8	64	51.7	15.8	2	48.0	12.1	54.5
05	257	39.0		35.8	79	26.5	15.8	2	35.9	12.2	54.5
06	272	39.2	S 3	36.7	94	01.3	15.8	S 2	23.7	12.2	54.5
07	287	39.4		37.7	108	36.1	15.8	2	11.5	12.1	54.5
M 08	302	39.6		38.7	123	10.9	15.8	1	59.4	12.2	54.5
A 09	317	39.8	. .	39.6	137	45.7	15.8	1	47.2	12.2	54.5
10	332	40.0		40.6	152	20.5	15.7	1	35.0	12.2	54.5
R 11	347	40.2		41.6	166	55.2	15.8	1	22.8	12.3	54.6
12	2	40.4	S 3	42.5	181	30.0	15.8	S 1	10.5	12.2	54.6
T 13	17	40.6		43.5	196	04.8	15.7	0	58.3	12.3	54.6
E 14	32	40.8		44.5	210	39.5	15.8	0	46.0	12.2	54.6
15	47	41.0	. .	45.4	225	14.3	15.7	0	33.8	12.3	54.6
S 16	62	41.2		46.4	239	49.0	15.7	0	21.5	12.2	54.6
17	77	41.4		47.4	254	23.7	15.7	S 0	09.3	12.3	54.6
18	92	41.6	S 3	48.3	268	58.4	15.7	N 0	03.0	12.3	54.6
19	107	41.8		49.3	283	33.1	15.7	0	15.3	12.3	54.7
20	122	42.0		50.3	298	07.8	15.7	0	27.6	12.3	54.7
21	137	42.2	. .	51.2	312	42.5	15.6	0	39.9	12.3	54.7
22	152	42.4		52.2	327	17.1	15.6	0	52.2	12.3	54.7
23	167	42.6		53.2	341	51.7	15.7	1	04.5	12.3	54.7
3 00	182	42.8	S 3	54.1	356	26.4	15.6	N 1	16.8	12.3	54.7
01	197	43.0		55.1	11	01.0	15.5	1	29.1	12.3	54.7
02	212	43.2		56.1	25	35.5	15.6	1	41.4	12.3	54.8
03	227	43.4	. .	57.0	40	10.1	15.5	1	53.7	12.3	54.8
04	242	43.6		58.0	54	44.6	15.5	2	06.0	12.3	54.8
05	257	43.8		59.0	69	19.1	15.5	2	18.3	12.3	54.8
06	272	44.0	S 3	59.9	83	53.6	15.5	N 2	30.6	12.3	54.8
M 07	287	44.2	4	00.9	98	28.1	15.5	2	42.9	12.3	54.8
I 08	302	44.4		01.9	113	02.6	15.4	2	55.2	12.3	54.8
E 09	317	44.6	. .	02.8	127	37.0	15.4	3	07.5	12.3	54.9
R 10	332	44.8		03.8	142	11.4	15.4	3	19.8	12.3	54.9
C 11	347	45.0		04.8	156	45.8	15.3	3	32.1	12.2	54.9
O 12	2	45.1	S 4	05.7	171	20.1	15.3	N 3	44.3	12.3	54.9
L 13	17	45.3		06.7	185	54.4	15.3	3	56.6	12.3	54.9
14	32	45.5		07.6	200	28.7	15.3	4	08.9	12.2	54.9
E 15	47	45.7	. .	08.6	215	03.0	15.2	4	21.1	12.2	54.9
S 16	62	45.9		09.6	229	37.2	15.2	4	33.3	12.2	55.0
17	77	46.1		10.5	244	11.4	15.2	4	45.5	12.3	55.0
18	92	46.3	S 4	11.5	258	45.6	15.1	N 4	57.8	12.1	55.0
19	107	46.5		12.5	273	19.7	15.1	5	09.9	12.2	55.0
20	122	46.7		13.4	287	53.8	15.1	5	22.1	12.2	55.0
21	137	46.9	. .	14.4	302	27.9	15.0	5	34.3	12.1	55.0
22	152	47.1		15.4	317	01.9	15.1	5	46.4	12.2	55.1
23	167	47.3		16.3	331	36.0	14.9	N 5	58.6	12.1	55.1
	SD	16.0	d	1.0	SD		14.8		14.9		15.0

Lat.	Crepúsculo Náutico	Crepúsculo Civil	Orto Sol	Orto Luna 1	Orto Luna 2	Orto Luna 3	Orto Luna 4
°	h m	h m	h m	h m	h m	h m	h m
N 72	03 54	05 16	06 23	18 25	18 05	17 45	17 22
N 70	04 06	05 19	06 20	18 18	18 05	17 51	17 36
68	04 15	05 21	06 16	18 13	18 05	17 56	17 48
66	04 22	05 23	06 14	18 08	18 05	18 01	17 57
64	04 28	05 24	06 11	18 04	18 05	18 05	18 06
62	04 33	05 25	06 10	18 01	18 05	18 08	18 13
60	04 38	05 26	06 08	17 58	18 05	18 11	18 19
N 58	04 41	05 27	06 06	17 55	18 05	18 14	18 24
56	04 44	05 28	06 05	17 53	18 05	18 16	18 29
54	04 47	05 28	06 04	17 51	18 05	18 18	18 33
52	04 50	05 29	06 02	17 49	18 05	18 20	18 37
50	04 52	05 29	06 01	17 47	18 05	18 22	18 41
45	04 56	05 30	05 59	17 43	18 05	18 26	18 49
N 40	04 59	05 30	05 57	17 40	18 05	18 29	18 56
35	05 01	05 30	05 55	17 37	18 05	18 32	19 01
30	05 02	05 30	05 54	17 35	18 05	18 35	19 06
20	05 04	05 29	05 51	17 30	18 05	18 39	19 15
N 10	05 03	05 28	05 49	17 27	18 05	18 43	19 23
0	05 01	05 25	05 46	17 23	18 05	18 47	19 30
S 10	04 58	05 22	05 43	17 20	18 05	18 50	19 38
20	04 53	05 19	05 41	17 16	18 05	18 54	19 46
30	04 45	05 13	05 37	17 11	18 05	18 59	19 55
35	04 40	05 10	05 35	17 09	18 05	19 02	20 00
40	04 34	05 06	05 33	17 06	18 05	19 05	20 06
45	04 26	05 01	05 30	17 03	18 05	19 08	20 13
S 50	04 15	04 54	05 27	16 59	18 05	19 13	20 22
52	04 10	04 51	05 25	16 57	18 05	19 15	20 25
54	04 05	04 48	05 24	16 55	18 05	19 17	20 30
56	03 59	04 44	05 22	16 53	18 05	19 19	20 35
58	03 51	04 40	05 20	16 50	18 05	19 22	20 40
S 60	03 43	04 35	05 18	16 47	18 06	19 25	20 46

Lat.	Ocaso Sol	Crepúsculo Civil	Crepúsculo Náutico	Ocaso Luna 1	Ocaso Luna 2	Ocaso Luna 3	Ocaso Luna 4
°	h m	h m	h m	h m	h m	h m	h m
N 72	17 13	18 20	19 41	03 20	05 10	06 58	08 51
N 70	17 17	18 18	19 30	03 32	05 13	06 55	08 39
68	17 20	18 16	19 21	03 41	05 16	06 52	08 29
66	17 23	18 14	19 14	03 49	05 19	06 49	08 21
64	17 26	18 13	19 08	03 56	05 21	06 47	08 14
62	17 28	18 12	19 03	04 02	05 23	06 45	08 08
60	17 30	18 11	18 59	04 07	05 25	06 43	08 03
N 58	17 31	18 10	18 56	04 11	05 26	06 42	07 59
56	17 33	18 10	18 53	04 15	05 27	06 41	07 55
54	17 34	18 09	18 50	04 18	05 29	06 39	07 52
52	17 35	18 09	18 48	04 22	05 30	06 38	07 48
50	17 36	18 08	18 46	04 24	05 31	06 37	07 45
45	17 39	18 08	18 42	04 30	05 33	06 35	07 39
N 40	17 41	18 08	18 39	04 36	05 34	06 34	07 34
35	17 43	18 08	18 37	04 40	05 36	06 32	07 30
30	17 44	18 08	18 36	04 44	05 37	06 31	07 26
20	17 47	18 09	18 35	04 50	05 39	06 29	07 19
N 10	17 50	18 11	18 35	04 56	05 41	06 27	07 13
0	17 53	18 13	18 37	05 02	05 43	06 25	07 07
S 10	17 55	18 16	18 41	05 07	05 45	06 23	07 02
20	17 58	18 20	18 46	05 13	05 47	06 21	06 56
30	18 02	18 26	18 54	05 19	05 49	06 19	06 49
35	18 04	18 29	18 59	05 23	05 50	06 17	06 45
40	18 06	18 34	19 06	05 27	05 51	06 16	06 41
45	18 09	18 39	19 14	05 31	05 53	06 14	06 36
S 50	18 13	18 45	19 25	05 37	05 55	06 12	06 30
52	18 14	18 48	19 30	05 40	05 56	06 11	06 27
54	18 16	18 52	19 35	05 43	05 56	06 10	06 24
56	18 18	18 56	19 42	05 46	05 57	06 09	06 21
58	18 20	19 00	19 49	05 49	05 59	06 08	06 17
S 60	18 22	19 05	19 58	05 53	06 00	06 06	06 13

Día	SOL E.T. (+) 00h	SOL E.T. (+) 12h	SOL Pas. Mer.	LUNA Pas. Sup.	LUNA Mer. Inf.	LUNA Edad	LUNA Fase
d	m s	m s	h m	h m	h m	d	%
1	10 12	10 22	11 50	23 33	11 12	14	99
2	10 32	10 41	11 49	24 15	11 54	15	100
3	10 51	11 00	11 49	00 15	12 36	16	99

(JUE., VIE., SAB.) 4, 5, 6 OCTUBRE DEL 2001

T.U.	ARIES	VENUS −3.9		MARTE −0.3		JUPITER −2.3		SATURNO −0.1	
	A.H.G.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
4 00	12 44.9	205 17.9	N 6 48.2	86 44.4	S25 27.0	267 15.4	N22 30.2	298 53.4	N20 45.7
01	27 47.4	220 17.5	47.1	101 45.1	26.8	282 17.6	30.2	313 55.9	45.7
02	42 49.9	235 17.1	45.9	116 45.9	26.6	297 19.8	30.2	328 58.4	45.6
03	57 52.3	250 16.7 . .	44.8	131 46.7 . .	26.3	312 22.1 . .	30.2	344 00.9 . .	45.6
04	72 54.8	265 16.3	43.7	146 47.4	26.1	327 24.3	30.2	359 03.4	45.6
05	87 57.2	280 15.9	42.5	161 48.2	25.8	342 26.5	30.1	14 05.9	45.6
06	102 59.7	295 15.4	N 6 41.4	176 48.9	S25 25.6	357 28.7	N22 30.1	29 08.4	N20 45.6
07	118 02.2	310 15.0	40.2	191 49.7	25.4	12 30.9	30.1	44 10.9	45.6
J 08	133 04.6	325 14.6	39.1	206 50.5	25.1	27 33.1	30.1	59 13.4	45.6
U 09	148 07.1	340 14.2 . .	37.9	221 51.2 . .	24.9	42 35.4 . .	30.1	74 15.9 . .	45.6
10	163 09.6	355 13.8	36.8	236 52.0	24.7	57 37.6	30.0	89 18.4	45.6
E 11	178 12.0	10 13.4	35.7	251 52.7	24.4	72 39.8	30.0	104 20.9	45.6
V 12	193 14.5	25 13.0	N 6 34.5	266 53.5	S25 24.2	87 42.0	N22 30.0	119 23.4	N20 45.6
13	208 17.0	40 12.6	33.4	281 54.2	24.0	102 44.2	30.0	134 25.9	45.5
E 14	223 19.4	55 12.1	32.2	296 55.0	23.7	117 46.5	30.0	149 28.4	45.5
15	238 21.9	70 11.7 . .	31.1	311 55.8 . .	23.5	132 48.7 . .	29.9	164 30.9 . .	45.5
S 16	253 24.4	85 11.3	29.9	326 56.5	23.2	147 50.9	29.9	179 33.4	45.5
17	268 26.8	100 10.9	28.8	341 57.3	23.0	162 53.1	29.9	194 35.9	45.5
18	283 29.3	115 10.5	N 6 27.6	356 58.0	S25 22.8	177 55.4	N22 29.9	209 38.4	N20 45.5
19	298 31.7	130 10.1	26.5	11 58.8	22.5	192 57.6	29.8	224 40.9	45.5
20	313 34.2	145 09.7	25.4	26 59.5	22.3	207 59.8	29.8	239 43.4	45.5
21	328 36.7	160 09.3 . .	24.2	42 00.3 . .	22.0	223 02.0 . .	29.8	254 45.9 . .	45.5
22	343 39.1	175 08.9	23.1	57 01.0	21.8	238 04.2	29.8	269 48.4	45.5
23	358 41.6	190 08.5	21.9	72 01.8	21.6	253 06.5	29.8	284 50.9	45.5
5 00	13 44.1	205 08.0	N 6 20.8	87 02.5	S25 21.3	268 08.7	N22 29.7	299 53.4	N20 45.5
01	28 46.5	220 07.6	19.6	102 03.3	21.1	283 10.9	29.7	314 55.9	45.4
02	43 49.0	235 07.2	18.5	117 04.1	20.8	298 13.1	29.7	329 58.4	45.4
03	58 51.5	250 06.8 . .	17.3	132 04.8 . .	20.6	313 15.4 . .	29.7	345 00.9 . .	45.4
04	73 53.9	265 06.4	16.2	147 05.6	20.3	328 17.6	29.7	0 03.4	45.4
05	88 56.4	280 06.0	15.0	162 06.3	20.1	343 19.8	29.6	15 05.9	45.4
06	103 58.8	295 05.6	N 6 13.9	177 07.1	S25 19.9	358 22.0	N22 29.6	30 08.4	N20 45.4
07	119 01.3	310 05.2	12.7	192 07.8	19.6	13 24.3	29.6	45 10.9	45.4
V 08	134 03.8	325 04.8	11.6	207 08.6	19.4	28 26.5	29.6	60 13.4	45.4
I 09	149 06.2	340 04.4 . .	10.4	222 09.3 . .	19.1	43 28.7 . .	29.6	75 15.9 . .	45.4
E 10	164 08.7	355 04.0	09.3	237 10.1	18.9	58 30.9	29.5	90 18.4	45.4
R 11	179 11.2	10 03.5	08.1	252 10.8	18.6	73 33.2	29.5	105 20.9	45.4
N 12	194 13.6	25 03.1	N 6 07.0	267 11.6	S25 18.4	88 35.4	N22 29.5	120 23.4	N20 45.3
E 13	209 16.1	40 02.7	05.8	282 12.3	18.1	103 37.6	29.5	135 25.9	45.3
S 14	224 18.6	55 02.3	04.7	297 13.1	17.9	118 39.9	29.5	150 28.4	45.3
15	239 21.0	70 01.9 . .	03.5	312 13.8 . .	17.6	133 42.1 . .	29.4	165 30.9 . .	45.3
16	254 23.5	85 01.5	02.4	327 14.6	17.4	148 44.3	29.4	180 33.4	45.3
17	269 26.0	100 01.1	01.2	342 15.3	17.2	163 46.5	29.4	195 36.0	45.3
18	284 28.4	115 00.7	N 6 00.1	357 16.1	S25 16.9	178 48.8	N22 29.4	210 38.5	N20 45.3
19	299 30.9	130 00.3	5 58.9	12 16.8	16.7	193 51.0	29.4	225 41.0	45.3
20	314 33.3	144 59.9	57.7	27 17.6	16.4	208 53.2	29.3	240 43.5	45.3
21	329 35.8	159 59.5 . .	56.6	42 18.3 . .	16.2	223 55.5 . .	29.3	255 46.0 . .	45.3
22	344 38.3	174 59.1	55.4	57 19.1	15.9	238 57.7	29.3	270 48.5	45.3
23	359 40.7	189 58.7	54.3	72 19.8	15.7	253 59.9	29.3	285 51.0	45.2
6 00	14 43.2	204 58.3	N 5 53.1	87 20.6	S25 15.4	269 02.2	N22 29.3	300 53.5	N20 45.2
01	29 45.7	219 57.8	52.0	102 21.3	15.2	284 04.4	29.2	315 56.0	45.2
02	44 48.1	234 57.4	50.8	117 22.1	14.9	299 06.6	29.2	330 58.5	45.2
03	59 50.6	249 57.0 . .	49.7	132 22.8 . .	14.7	314 08.9 . .	29.2	346 01.0 . .	45.2
04	74 53.1	264 56.6	48.5	147 23.6	14.4	329 11.1	29.2	1 03.5	45.2
05	89 55.5	279 56.2	47.3	162 24.3	14.2	344 13.3	29.2	16 06.0	45.2
06	104 58.0	294 55.8	N 5 46.2	177 25.0	S25 13.9	359 15.6	N22 29.1	31 08.5	N20 45.2
S 07	120 00.5	309 55.4	45.0	192 25.8	13.7	14 17.8	29.1	46 11.1	45.2
08	135 02.9	324 55.0	43.9	207 26.5	13.4	29 20.0	29.1	61 13.6	45.2
A 09	150 05.4	339 54.6 . .	42.7	222 27.3 . .	13.1	44 22.3 . .	29.1	76 16.1 . .	45.2
10	165 07.8	354 54.2	41.6	237 28.0	12.9	59 24.5	29.1	91 18.6	45.1
B 11	180 10.3	9 53.8	40.4	252 28.8	12.6	74 26.7	29.1	106 21.1	45.1
A 12	195 12.8	24 53.4	N 5 39.2	267 29.5	S25 12.4	89 29.0	N22 29.0	121 23.6	N20 45.1
13	210 15.2	39 53.0	38.1	282 30.3	12.1	104 31.2	29.0	136 26.1	45.1
D 14	225 17.7	54 52.6	36.9	297 31.0	11.9	119 33.4	29.0	151 28.6	45.1
15	240 20.2	69 52.2 . .	35.8	312 31.8 . .	11.6	134 35.7 . .	29.0	166 31.1 . .	45.1
O 16	255 22.6	84 51.8	34.6	327 32.5	11.4	149 37.9	29.0	181 33.6	45.1
17	270 25.1	99 51.4	33.4	342 33.2	11.1	164 40.1	28.9	196 36.1	45.1
18	285 27.6	114 51.0	N 5 32.3	357 34.0	S25 10.9	179 42.4	N22 28.9	211 38.7	N20 45.1
19	300 30.0	129 50.6	31.1	12 34.7	10.6	194 44.6	28.9	226 41.2	45.1
20	315 32.5	144 50.2	29.9	27 35.5	10.3	209 46.8	28.9	241 43.7	45.0
21	330 34.9	159 49.8 . .	28.8	42 36.2 . .	10.1	224 49.1 . .	28.9	256 46.2 . .	45.0
22	345 37.4	174 49.4	27.6	57 37.0	09.8	239 51.3	28.8	271 48.7	45.0
23	0 39.9	189 49.0	26.5	72 37.7	09.6	254 53.6	28.8	286 51.2	45.0
	h m								
Pas. Mer.	23 01.3	v −0.4	d 1.2	v 0.8	d 0.2	v 2.2	d 0.0	v 2.5	d 0.0

ESTRELLAS

Nombre	A.H.S.	Dec.
	° ′	° ′
Acamar	315 24.9	S40 17.7
Achernar	335 32.9	S57 13.7
Acrux	173 20.5	S63 06.3
Adhara	255 19.8	S28 58.2
Aldebaran	290 59.8	N16 30.8
Alioth	166 29.2	N55 57.2
Alkaid	153 06.5	N49 18.5
Al Na'ir	27 54.8	S46 57.3
Alnilam	275 55.6	S 1 11.9
Alphard	218 05.4	S 8 39.7
Alphecca	126 19.1	N26 42.8
Alpheratz	357 52.7	N29 06.0
Altair	62 17.2	N 8 52.5
Ankaa	353 24.3	S42 17.8
Antares	112 37.8	S26 26.1
Arcturus	146 04.4	N19 10.7
Atria	107 48.3	S69 02.0
Avior	234 22.1	S59 30.5
Bellatrix	278 41.8	N 6 21.2
Betelgeuse	271 11.2	N 7 24.5
Canopus	264 00.2	S52 41.5
Capella	280 47.9	N45 59.9
Deneb	49 37.6	N45 17.4
Denebola	182 43.3	N14 34.0
Diphda	349 04.8	S17 58.6
Dubhe	194 03.4	N61 44.5
Elnath	278 24.2	N28 36.5
Eltanin	90 50.6	N51 29.6
Enif	33 56.0	N 9 53.1
Fomalhaut	15 33.8	S29 36.9
Gacrux	172 11.9	S57 07.2
Gienah	176 02.2	S17 32.8
Hadar	149 01.8	S60 22.8
Hamal	328 10.9	N23 28.2
Kaus Aust.	83 56.1	S34 23.1
Kochab	137 20.5	N74 09.2
Markab	13 47.3	N15 12.9
Menkar	314 24.4	N 4 05.8
Menkent	148 18.9	S36 22.6
Miaplacidus	221 42.3	S69 43.1
Mirfak	308 53.3	N49 51.9
Nunki	76 09.7	S26 17.7
Peacock	53 33.4	S56 44.0
Pollux	243 39.1	N28 01.3
Procyon	245 09.4	N 5 13.4
Rasalhague	96 15.1	N12 33.7
Regulus	207 53.5	N11 57.7
Rigel	281 20.8	S 8 11.8
Rigil Kent.	140 05.2	S60 50.5
Sabik	102 23.3	S15 43.5
Schedar	349 50.6	N56 32.8
Shaula	96 34.6	S37 06.4
Sirius	258 41.9	S16 42.9
Spica	158 41.3	S11 10.0
Suhail	222 59.5	S43 26.0
Vega	80 45.2	N38 47.4
Zuben'ubi	137 15.9	S16 02.8

	A.H.S.	Pas. Mer.
	° ′	h m
Venus	191 24.0	10 20
Marte	73 18.5	18 11
Júpiter	254 24.6	6 07
Saturno	286 09.3	4 00

T.U.	SOL				LUNA					
	A.H.G.		Dec.		A.H.G.	v	Dec.	d	P.H.	
d h	° ′		° ′		° ′	′	° ′	′	′	
4 00	182 47.5	S	4 17.3		346 09.9	14.9	N 6 10.7	12.1	55.1	
01	197 47.7		18.3		0 43.8	14.9	6 22.8	12.1	55.1	
02	212 47.9		19.2		15 17.7	14.9	6 34.9	12.0	55.1	
03	227 48.1	. .	20.2		29 51.6	14.8	6 46.9	12.1	55.1	
04	242 48.2		21.1		44 25.4	14.8	6 59.0	12.0	55.2	
05	257 48.4		22.1		58 59.2	14.7	7 11.0	12.0	55.2	
06	272 48.6	S	4 23.1		73 32.9	14.7	N 7 23.0	11.9	55.2	
07	287 48.8		24.0		88 06.6	14.6	7 34.9	12.0	55.2	
J 08	302 49.0		25.0		102 40.2	14.6	7 46.9	11.9	55.2	
U 09	317 49.2	. .	26.0		117 13.8	14.6	7 58.8	11.9	55.2	
10	332 49.4		26.9		131 47.4	14.5	8 10.7	11.9	55.3	
E 11	347 49.6		27.9		146 20.9	14.5	8 22.6	11.8	55.3	
V 12	2 49.8	S	4 28.9		160 54.4	14.4	N 8 34.4	11.8	55.3	
13	17 50.0		29.8		175 27.8	14.3	8 46.2	11.8	55.3	
E 14	32 50.2		30.8		190 01.1	14.4	8 58.0	11.7	55.3	
15	47 50.4	. .	31.7		204 34.5	14.2	9 09.7	11.8	55.3	
S 16	62 50.5		32.7		219 07.7	14.3	9 21.5	11.6	55.4	
17	77 50.7		33.7		233 41.0	14.1	9 33.1	11.7	55.4	
18	92 50.9	S	4 34.6		248 14.1	14.2	N 9 44.8	11.6	55.4	
19	107 51.1		35.6		262 47.3	14.0	9 56.4	11.6	55.4	
20	122 51.3		36.6		277 20.3	14.1	10 08.0	11.5	55.4	
21	137 51.5	. .	37.5		291 53.4	13.9	10 19.5	11.5	55.5	
22	152 51.7		38.5		306 26.3	13.9	10 31.0	11.5	55.5	
23	167 51.9		39.4		320 59.2	13.9	10 42.5	11.4	55.5	
5 00	182 52.1	S	4 40.4		335 32.1	13.8	N10 53.9	11.4	55.5	
01	197 52.3		41.4		350 04.9	13.7	11 05.3	11.4	55.5	
02	212 52.4		42.3		4 37.6	13.7	11 16.7	11.3	55.5	
03	227 52.6	. .	43.3		19 10.3	13.7	11 28.0	11.2	55.6	
04	242 52.8		44.3		33 43.0	13.5	11 39.2	11.3	55.6	
05	257 53.0		45.2		48 15.5	13.5	11 50.5	11.1	55.6	
06	272 53.2	S	4 46.2		62 48.0	13.5	N12 01.6	11.2	55.6	
07	287 53.4		47.1		77 20.5	13.4	12 12.8	11.0	55.6	
V 08	302 53.6		48.1		91 52.9	13.3	12 23.8	11.1	55.7	
I 09	317 53.8	. .	49.1		106 25.2	13.3	12 34.9	11.0	55.7	
E 10	332 54.0		50.0		120 57.5	13.2	12 45.9	10.9	55.7	
R 11	347 54.1		51.0		135 29.7	13.1	12 56.8	10.9	55.7	
12	2 54.3	S	4 51.9		150 01.8	13.1	N13 07.7	10.8	55.7	
N 13	17 54.5		52.9		164 33.9	13.0	13 18.5	10.8	55.8	
E 14	32 54.7		53.9		179 05.9	13.0	13 29.3	10.7	55.8	
S 15	47 54.9	. .	54.8		193 37.9	12.9	13 40.0	10.7	55.8	
16	62 55.1		55.8		208 09.8	12.8	13 50.7	10.6	55.8	
17	77 55.3		56.7		222 41.6	12.7	14 01.3	10.5	55.8	
18	92 55.5	S	4 57.7		237 13.3	12.7	N14 11.8	10.5	55.9	
19	107 55.6		58.7		251 45.0	12.6	14 22.3	10.5	55.9	
20	122 55.8	4	59.6		266 16.6	12.6	14 32.8	10.4	55.9	
21	137 56.0	5	00.6		280 48.2	12.5	14 43.2	10.3	55.9	
22	152 56.2		01.5		295 19.7	12.4	14 53.5	10.2	55.9	
23	167 56.4		02.5		309 51.1	12.3	15 03.7	10.2	56.0	
6 00	182 56.6	S	5 03.5		324 22.4	12.3	N15 13.9	10.1	56.0	
01	197 56.8		04.4		338 53.7	12.2	15 24.0	10.1	56.0	
02	212 56.9		05.4		353 24.9	12.1	15 34.1	10.0	56.0	
03	227 57.1	. .	06.3		7 56.0	12.0	15 44.1	9.9	56.0	
04	242 57.3		07.3		22 27.0	12.0	15 54.0	9.9	56.1	
05	257 57.5		08.3		36 58.0	11.9	16 03.9	9.8	56.1	
06	272 57.7	S	5 09.2		51 28.9	11.9	N16 13.7	9.7	56.1	
07	287 57.9		10.2		65 59.8	11.7	16 23.4	9.6	56.1	
S 08	302 58.0		11.1		80 30.5	11.7	16 33.0	9.6	56.2	
A 09	317 58.2	. .	12.1		95 01.2	11.6	16 42.6	9.5	56.2	
10	332 58.4		13.1		109 31.8	11.5	16 52.1	9.4	56.2	
B 11	347 58.6		14.0		124 02.3	11.5	17 01.5	9.4	56.2	
A 12	2 58.8	S	5 15.0		138 32.8	11.4	N17 10.9	9.2	56.2	
13	17 59.0		15.9		153 03.2	11.3	17 20.1	9.2	56.3	
D 14	32 59.1		16.9		167 33.5	11.2	17 29.3	9.1	56.3	
15	47 59.3	. .	17.8		182 03.7	11.2	17 38.4	9.1	56.3	
O 16	62 59.5		18.8		196 33.9	11.0	17 47.5	8.9	56.3	
17	77 59.7		19.8		211 03.9	11.0	17 56.4	8.9	56.4	
18	92 59.9	S	5 20.7		225 33.9	11.0	N18 05.3	8.7	56.4	
19	108 00.1		21.7		240 03.9	10.8	18 14.0	8.7	56.4	
20	123 00.2		22.6		254 33.7	10.8	18 22.7	8.6	56.4	
21	138 00.4	. .	23.6		269 03.5	10.7	18 31.3	8.6	56.4	
22	153 00.6		24.5		283 33.2	10.6	18 39.9	8.4	56.5	
23	168 00.8		25.5		298 02.8	10.5	N18 48.3	8.3	56.5	
	SD 16.0		d 1.0		SD	15.1		15.2		15.3

Lat.	Crepúsculo Náutico	Crepúsculo Civil	Orto Sol	Orto Luna 4	Orto Luna 5	Orto Luna 6	Orto Luna 7
°	h m	h m	h m	h m	h m	h m	h m
N 72	04 09	05 29	06 37	17 22	16 51	15 41	▭
N 70	04 19	05 31	06 32	17 36	17 18	16 48	▭
68	04 26	05 32	06 27	17 48	17 38	17 25	17 00
66	04 32	05 32	06 23	17 57	17 54	17 51	17 48
64	04 37	05 33	06 20	18 06	18 07	18 11	18 19
62	04 41	05 33	06 17	18 13	18 19	18 28	18 43
60	04 45	05 33	06 15	18 19	18 28	18 42	19 01
N 58	04 48	05 34	06 13	18 24	18 37	18 54	19 17
56	04 51	05 34	06 11	18 29	18 44	19 04	19 30
54	04 53	05 34	06 09	18 33	18 51	19 13	19 42
52	04 55	05 34	06 08	18 37	18 57	19 21	19 52
50	04 56	05 34	06 06	18 41	19 03	19 29	20 01
45	05 00	05 34	06 03	18 49	19 15	19 45	20 21
N 40	05 02	05 33	06 00	18 56	19 24	19 58	20 37
35	05 03	05 32	05 58	19 01	19 33	20 09	20 50
30	05 04	05 32	05 56	19 06	19 40	20 19	21 02
20	05 04	05 30	05 52	19 15	19 54	20 36	21 22
N 10	05 03	05 27	05 48	19 23	20 05	20 50	21 40
0	05 00	05 24	05 45	19 30	20 16	21 04	21 56
S 10	04 56	05 21	05 42	19 38	20 27	21 18	22 13
20	04 50	05 16	05 38	19 46	20 38	21 34	22 31
30	04 41	05 10	05 34	19 55	20 52	21 51	22 51
35	04 36	05 06	05 31	20 00	21 00	22 01	23 04
40	04 28	05 01	05 28	20 06	21 09	22 13	23 17
45	04 20	04 55	05 25	20 13	21 19	22 27	23 34
S 50	04 08	04 48	05 20	20 22	21 32	22 44	23 55
52	04 03	04 44	05 19	20 25	21 38	22 52	24 04
54	03 57	04 40	05 16	20 30	21 45	23 01	24 16
56	03 50	04 36	05 14	20 35	21 52	23 11	24 28
58	03 41	04 31	05 11	20 40	22 00	23 22	24 43
S 60	03 32	04 26	05 09	20 46	22 10	23 36	25 00

Lat.	Ocaso Sol	Crepúsculo Civil	Crepúsculo Náutico	Ocaso Luna 4	Ocaso Luna 5	Ocaso Luna 6	Ocaso Luna 7
°	h m	h m	h m	h m	h m	h m	h m
N 72	16 58	18 05	19 24	08 51	10 56	13 45	▭
N 70	17 03	18 04	19 15	08 39	10 31	12 39	▭
68	17 08	18 03	19 08	08 29	10 12	12 04	14 14
66	17 12	18 03	19 02	08 21	09 57	11 39	13 27
64	17 15	18 02	18 58	08 14	09 45	11 19	12 56
62	17 18	18 02	18 54	08 08	09 35	11 03	12 34
60	17 21	18 02	18 50	08 03	09 26	10 50	12 15
N 58	17 23	18 02	18 47	07 59	09 18	10 39	12 00
56	17 25	18 02	18 45	07 55	09 11	10 29	11 47
54	17 27	18 02	18 43	07 52	09 05	10 21	11 36
52	17 28	18 02	18 41	07 48	09 00	10 13	11 26
50	17 30	18 02	18 39	07 45	08 55	10 06	11 18
45	17 33	18 02	18 36	07 39	08 45	09 51	10 59
N 40	17 36	18 03	18 34	07 34	08 36	09 39	10 44
35	17 38	18 04	18 33	07 30	08 28	09 29	10 31
30	17 41	18 05	18 32	07 26	08 22	09 20	10 20
20	17 45	18 07	18 32	07 19	08 11	09 05	10 01
N 10	17 48	18 09	18 34	07 13	08 01	08 51	09 44
0	17 52	18 12	18 36	07 07	07 52	08 39	09 29
S 10	17 55	18 16	18 41	07 02	07 43	08 26	09 13
20	17 59	18 21	18 47	06 56	07 33	08 13	08 57
30	18 04	18 28	18 56	06 49	07 22	07 58	08 38
35	18 06	18 32	19 02	06 45	07 16	07 49	08 27
40	18 09	18 37	19 09	06 41	07 08	07 39	08 15
45	18 13	18 43	19 18	06 36	07 00	07 27	08 00
S 50	18 17	18 50	19 30	06 30	06 50	07 13	07 42
52	18 19	18 54	19 35	06 27	06 45	07 07	07 34
54	18 22	18 58	19 42	06 24	06 40	07 00	07 24
56	18 24	19 02	19 49	06 21	06 35	06 52	07 14
58	18 27	19 07	19 57	06 17	06 28	06 42	07 02
S 60	18 30	19 13	20 07	06 13	06 21	06 32	06 48

Día	SOL E.T. (+) 00h	SOL E.T. (+) 12h	Pas. Mer.	LUNA Pas. Sup.	LUNA Mer. Inf.	LUNA Edad	LUNA Fase
d	m s	m s	h m	h m	h m	d	%
4	11 10	11 19	11 49	00 57	13 19	17	96
5	11 28	11 37	11 48	01 41	14 04	18	92
6	11 46	11 55	11 48	02 27	14 51	19	85

T.U.	ARIES	VENUS −3.9		MARTE −0.3		JUPITER −2.3		SATURNO −0.1	
	A.H.G.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
7 00	15 42.3	204 48.5	N 5 25.3	87 38.4	S25 09.3	269 55.8	N22 28.8	301 53.7	N20 45.0
01	30 44.8	219 48.1	24.1	102 39.2	09.1	284 58.0	28.8	316 56.2	45.0
02	45 47.3	234 47.7	23.0	117 39.9	08.8	300 00.3	28.8	331 58.7	45.0
03	60 49.7	249 47.3 . .	21.8	132 40.7 . .	08.5	315 02.5 . .	28.7	347 01.3 . .	45.0
04	75 52.2	264 46.9	20.6	147 41.4	08.3	330 04.8	28.7	2 03.8	45.0
05	90 54.7	279 46.5	19.5	162 42.1	08.0	345 07.0	28.7	17 06.3	45.0
06	105 57.1	294 46.1	N 5 18.3	177 42.9	S25 07.8	0 09.2	N22 28.7	32 08.8	N20 44.9
07	120 59.6	309 45.7	17.1	192 43.6	07.5	15 11.5	28.7	47 11.3	44.9
D 08	136 02.1	324 45.3	16.0	207 44.4	07.2	30 13.7	28.7	62 13.8	44.9
O 09	151 04.5	339 44.9 . .	14.8	222 45.1 . .	07.0	45 16.0 . .	28.6	77 16.3 . .	44.9
M 10	166 07.0	354 44.5	13.6	237 45.8	06.7	60 18.2	28.6	92 18.8	44.9
I 11	181 09.4	9 44.1	12.5	252 46.6	06.5	75 20.5	28.6	107 21.4	44.9
12	196 11.9	24 43.7	N 5 11.3	267 47.3	S25 06.2	90 22.7	N22 28.6	122 23.9	N20 44.9
N 13	211 14.4	39 43.3	10.1	282 48.1	05.9	105 24.9	28.6	137 26.4	44.9
G 14	226 16.8	54 42.9	09.0	297 48.8	05.7	120 27.2	28.5	152 28.9	44.9
O 15	241 19.3	69 42.5 . .	07.8	312 49.5 . .	05.4	135 29.4 . .	28.5	167 31.4 . .	44.9
16	256 21.8	84 42.1	06.6	327 50.3	05.1	150 31.7	28.5	182 33.9	44.9
17	271 24.2	99 41.7	05.5	342 51.0	04.9	165 33.9	28.5	197 36.4	44.8
18	286 26.7	114 41.3	N 5 04.3	357 51.8	S25 04.6	180 36.2	N22 28.5	212 39.0	N20 44.8
19	301 29.2	129 40.9	03.1	12 52.5	04.3	195 38.4	28.4	227 41.5	44.8
20	316 31.6	144 40.5	02.0	27 53.2	04.1	210 40.6	28.4	242 44.0	44.8
21	331 34.1	159 40.1	5 00.8	42 54.0 . .	03.8	225 42.9 . .	28.4	257 46.5 . .	44.8
22	346 36.6	174 39.7	4 59.6	57 54.7	03.6	240 45.1	28.4	272 49.0	44.8
23	1 39.0	189 39.3	58.5	72 55.4	03.3	255 47.4	28.4	287 51.5	44.8
8 00	16 41.5	204 38.9	N 4 57.3	87 56.2	S25 03.0	270 49.6	N22 28.4	302 54.1	N20 44.8
01	31 43.9	219 38.5	56.1	102 56.9	02.8	285 51.9	28.3	317 56.6	44.8
02	46 46.4	234 38.1	54.9	117 57.7	02.5	300 54.1	28.3	332 59.1	44.7
03	61 48.9	249 37.7 . .	53.8	132 58.4 . .	02.2	315 56.4 . .	28.3	348 01.6 . .	44.7
04	76 51.3	264 37.3	52.6	147 59.1	02.0	330 58.6	28.3	3 04.1	44.7
05	91 53.8	279 36.9	51.4	162 59.9	01.7	346 00.9	28.3	18 06.6	44.7
06	106 56.3	294 36.5	N 4 50.3	178 00.6	S25 01.4	1 03.1	N22 28.2	33 09.2	N20 44.7
07	121 58.7	309 36.1	49.1	193 01.3	01.1	16 05.4	28.2	48 11.7	44.7
L 08	137 01.2	324 35.7	47.9	208 02.1	00.9	31 07.6	28.2	63 14.2	44.7
U 09	152 03.7	339 35.3 . .	46.7	223 02.8 . .	00.6	46 09.9 . .	28.2	78 16.7 . .	44.7
N 10	167 06.1	354 34.9	45.6	238 03.5	00.3	61 12.1	28.2	93 19.2	44.7
11	182 08.6	9 34.5	44.4	253 04.3	25 00.1	76 14.4	28.2	108 21.8	44.7
E 12	197 11.1	24 34.1	N 4 43.2	268 05.0	S24 59.8	91 16.6	N22 28.1	123 24.3	N20 44.6
S 13	212 13.5	39 33.7	42.0	283 05.7	59.5	106 18.9	28.1	138 26.8	44.6
14	227 16.0	54 33.3	40.9	298 06.5	59.3	121 21.1	28.1	153 29.3	44.6
15	242 18.4	69 32.9 . .	39.7	313 07.2 . .	59.0	136 23.4 . .	28.1	168 31.8 . .	44.6
16	257 20.9	84 32.5	38.5	328 07.9	58.7	151 25.6	28.1	183 34.3	44.6
17	272 23.4	99 32.1	37.3	343 08.7	58.4	166 27.9	28.0	198 36.9	44.6
18	287 25.8	114 31.7	N 4 36.2	358 09.4	S24 58.2	181 30.1	N22 28.0	213 39.4	N20 44.6
19	302 28.3	129 31.3	35.0	13 10.1	57.9	196 32.4	28.0	228 41.9	44.6
20	317 30.8	144 30.9	33.8	28 10.9	57.6	211 34.6	28.0	243 44.4	44.6
21	332 33.2	159 30.5 . .	32.6	43 11.6 . .	57.4	226 36.9 . .	28.0	258 46.9 . .	44.6
22	347 35.7	174 30.1	31.5	58 12.3	57.1	241 39.1	28.0	273 49.5	44.5
23	2 38.2	189 29.7	30.3	73 13.1	56.8	256 41.4	27.9	288 52.0	44.5
9 00	17 40.6	204 29.3	N 4 29.1	88 13.8	S24 56.5	271 43.6	N22 27.9	303 54.5	N20 44.5
01	32 43.1	219 28.9	27.9	103 14.5	56.3	286 45.9	27.9	318 57.0	44.5
02	47 45.5	234 28.5	26.7	118 15.3	56.0	301 48.2	27.9	333 59.6	44.5
03	62 48.0	249 28.2 . .	25.6	133 16.0 . .	55.7	316 50.4 . .	27.9	349 02.1 . .	44.5
04	77 50.5	264 27.8	24.4	148 16.7	55.4	331 52.7	27.9	4 04.6	44.5
05	92 52.9	279 27.4	23.2	163 17.4	55.2	346 54.9	27.8	19 07.1	44.5
06	107 55.4	294 27.0	N 4 22.0	178 18.2	S24 54.9	1 57.2	N22 27.8	34 09.6	N20 44.5
07	122 57.9	309 26.6	20.9	193 18.9	54.6	16 59.4	27.8	49 12.2	44.4
M 08	138 00.3	324 26.2	19.7	208 19.6	54.3	32 01.7	27.8	64 14.7	44.4
A 09	153 02.8	339 25.8 . .	18.5	223 20.4 . .	54.0	47 03.9 . .	27.8	79 17.2 . .	44.4
R 10	168 05.3	354 25.4	17.3	238 21.1	53.8	62 06.2	27.7	94 19.7	44.4
11	183 07.7	9 25.0	16.1	253 21.8	53.5	77 08.5	27.7	109 22.3	44.4
T 12	198 10.2	24 24.6	N 4 15.0	268 22.5	S24 53.2	92 10.7	N22 27.7	124 24.8	N20 44.4
13	213 12.7	39 24.2	13.8	283 23.3	52.9	107 13.0	27.7	139 27.3	44.4
E 14	228 15.1	54 23.8	12.6	298 24.0	52.7	122 15.2	27.7	154 29.8	44.4
15	243 17.6	69 23.4 . .	11.4	313 24.7 . .	52.4	137 17.5 . .	27.7	169 32.4 . .	44.4
S 16	258 20.0	84 23.0	10.2	328 25.5	52.1	152 19.8	27.6	184 34.9	44.3
17	273 22.5	99 22.6	09.0	343 26.2	51.8	167 22.0	27.6	199 37.4	44.3
18	288 25.0	114 22.2	N 4 07.9	358 26.9	S24 51.5	182 24.3	N22 27.6	214 39.9	N20 44.3
19	303 27.4	129 21.8	06.7	13 27.6	51.3	197 26.5	27.6	229 42.5	44.3
20	318 29.9	144 21.4	05.5	28 28.4	51.0	212 28.8	27.6	244 45.0	44.3
21	333 32.4	159 21.0 . .	04.3	43 29.1 . .	50.7	227 31.1 . .	27.6	259 47.5 . .	44.3
22	348 34.8	174 20.6	03.1	58 29.8	50.4	242 33.3	27.5	274 50.0	44.3
23	3 37.3	189 20.2	01.9	73 30.6	50.1	257 35.6	27.5	289 52.6	44.3
	h m								
Pas. Mer.	22 49.5	v −0.4	d 1.2	v 0.7	d 0.3	v 2.3	d 0.0	v 2.5	d 0.0

ESTRELLAS

Nombre	A.H.S.	Dec.
	° ′	° ′
Acamar	315 24.9	S40 17.8
Achernar	335 32.9	S57 13.7
Acrux	173 20.5	S63 06.3
Adhara	255 19.8	S28 58.2
Aldebaran	290 59.8	N16 30.8
Alioth	166 29.2	N55 57.2
Alkaid	153 06.5	N49 18.5
Al Na'ir	27 54.8	S46 57.3
Alnilam	275 55.6	S 1 11.9
Alphard	218 05.3	S 8 39.7
Alphecca	126 19.1	N26 42.8
Alpheratz	357 52.7	N29 06.0
Altair	62 17.2	N 8 52.5
Ankaa	353 24.3	S42 17.9
Antares	112 37.8	S26 26.1
Arcturus	146 04.4	N19 10.6
Atria	107 48.3	S69 02.0
Avior	234 22.1	S59 30.5
Bellatrix	278 41.8	N 6 21.2
Betelgeuse	271 11.2	N 7 24.5
Canopus	264 00.1	S52 41.5
Capella	280 47.9	N45 59.9
Deneb	49 37.6	N45 17.4
Denebola	182 43.3	N14 33.9
Diphda	349 04.8	S17 58.6
Dubhe	194 03.4	N61 44.5
Elnath	278 24.1	N28 36.5
Eltanin	90 50.6	N51 29.6
Enif	33 56.0	N 9 53.1
Fomalhaut	15 33.8	S29 36.9
Gacrux	172 11.9	S57 07.2
Gienah	176 02.1	S17 32.8
Hadar	149 01.8	S60 22.8
Hamal	328 10.9	N23 28.2
Kaus Aust.	83 56.1	S34 23.1
Kochab	137 20.5	N74 09.1
Markab	13 47.3	N15 12.9
Menkar	314 24.4	N 4 05.8
Menkent	148 18.9	S36 22.6
Miaplacidus	221 42.3	S69 43.1
Mirfak	308 53.2	N49 51.9
Nunki	76 09.7	S26 17.7
Peacock	53 33.4	S56 44.0
Pollux	243 39.0	N28 01.3
Procyon	245 09.4	N 5 13.4
Rasalhague	96 15.1	N12 33.7
Regulus	207 53.5	N11 57.7
Rigel	281 20.8	S 8 11.8
Rigil Kent.	140 05.2	S60 50.5
Sabik	102 23.3	S15 43.5
Schedar	349 50.6	N56 32.8
Shaula	96 34.6	S37 06.4
Sirius	258 41.8	S16 42.9
Spica	158 41.3	S11 10.0
Suhail	222 59.5	S43 26.0
Vega	80 45.3	N38 47.4
Zuben'ubi	137 16.0	S16 02.8

	A.H.S.	Pas. Mer.
	° ′	h m
Venus	187 57.4	10 22
Marte	71 14.7	18 07
Júpiter	254 08.1	5 56
Saturno	286 12.6	3 48

T.U.	SOL				LUNA					
	A.H.G.		Dec.		A.H.G.	v	Dec.	d	P.H.	
d h	°	′	°	′	°	′	′	°	′	′	′
7 00	183	01.0	S 5	26.5	312	32.3	10.4	N18	56.6	8.3	56.5
01	198	01.2		27.4	327	01.7	10.4	19	04.9	8.2	56.5
02	213	01.3		28.4	341	31.1	10.3	19	13.1	8.0	56.6
03	228	01.5	. .	29.3	356	00.4	10.2	19	21.1	8.0	56.6
04	243	01.7		30.3	10	29.6	10.1	19	29.1	7.9	56.6
05	258	01.9		31.2	24	58.7	10.1	19	37.0	7.8	56.6
06	273	02.1	S 5	32.2	39	27.8	10.0	N19	44.8	7.6	56.7
07	288	02.2		33.2	53	56.8	9.9	19	52.4	7.6	56.7
08	303	02.4		34.1	68	25.7	9.8	20	00.0	7.5	56.7
D 09	318	02.6	. .	35.1	82	54.5	9.7	20	07.5	7.4	56.7
O 10	333	02.8		36.0	97	23.2	9.7	20	14.9	7.3	56.8
M 11	348	03.0		37.0	111	51.9	9.5	20	22.2	7.2	56.8
I 12	3	03.1	S 5	37.9	126	20.4	9.5	N20	29.4	7.0	56.8
N 13	18	03.3		38.9	140	48.9	9.4	20	36.4	7.0	56.8
G 14	33	03.5		39.8	155	17.3	9.4	20	43.4	6.9	56.8
O 15	48	03.7	. .	40.8	169	45.7	9.3	20	50.3	6.7	56.9
16	63	03.8		41.8	184	14.0	9.1	20	57.0	6.7	56.9
17	78	04.0		42.7	198	42.1	9.1	21	03.7	6.5	56.9
18	93	04.2	S 5	43.7	213	10.2	9.1	N21	10.2	6.5	56.9
19	108	04.4		44.6	227	38.3	8.9	21	16.7	6.3	57.0
20	123	04.6		45.6	242	06.2	8.9	21	23.0	6.2	57.0
21	138	04.7	. .	46.5	256	34.1	8.8	21	29.2	6.1	57.0
22	153	04.9		47.5	271	01.9	8.7	21	35.3	6.0	57.0
23	168	05.1		48.4	285	29.6	8.7	21	41.3	5.8	57.1
8 00	183	05.3	S 5	49.4	299	57.3	8.5	N21	47.1	5.8	57.1
01	198	05.4		50.3	314	24.8	8.5	21	52.9	5.6	57.1
02	213	05.6		51.3	328	52.3	8.4	21	58.5	5.5	57.1
03	228	05.8	. .	52.2	343	19.7	8.4	22	04.0	5.4	57.2
04	243	06.0		53.2	357	47.1	8.3	22	09.4	5.2	57.2
05	258	06.1		54.2	12	14.4	8.1	22	14.6	5.2	57.2
06	273	06.3	S 5	55.1	26	41.5	8.2	N22	19.8	5.0	57.2
07	288	06.5		56.1	41	08.7	8.0	22	24.8	4.9	57.3
L 08	303	06.7		57.0	55	35.7	8.0	22	29.7	4.8	57.3
U 09	318	06.8	. .	58.0	70	02.7	7.9	22	34.5	4.6	57.3
N 10	333	07.0		58.9	84	29.6	7.9	22	39.1	4.6	57.4
E 11	348	07.2	5	59.9	98	56.5	7.7	22	43.7	4.3	57.4
S 12	3	07.4	S 6	00.8	113	23.2	7.7	N22	48.0	4.3	57.4
13	18	07.5		01.8	127	49.9	7.7	22	52.3	4.1	57.4
14	33	07.7		02.7	142	16.6	7.6	22	56.4	4.1	57.5
15	48	07.9	. .	03.7	156	43.2	7.5	23	00.5	3.8	57.5
16	63	08.1		04.6	171	09.7	7.4	23	04.3	3.8	57.5
17	78	08.2		05.6	185	36.1	7.4	23	08.1	3.6	57.5
18	93	08.4	S 6	06.5	200	02.5	7.3	N23	11.7	3.4	57.6
19	108	08.6		07.5	214	28.8	7.2	23	15.1	3.4	57.6
20	123	08.8		08.4	228	55.0	7.2	23	18.5	3.2	57.6
21	138	08.9	. .	09.4	243	21.2	7.1	23	21.7	3.0	57.6
22	153	09.1		10.3	257	47.3	7.1	23	24.7	3.0	57.7
23	168	09.3		11.3	272	13.4	7.0	23	27.7	2.8	57.7
9 00	183	09.4	S 6	12.2	286	39.4	7.0	N23	30.5	2.6	57.7
01	198	09.6		13.2	301	05.4	6.9	23	33.1	2.5	57.7
02	213	09.8		14.1	315	31.3	6.8	23	35.6	2.4	57.8
03	228	10.0	. .	15.1	329	57.1	6.8	23	38.0	2.2	57.8
04	243	10.1		16.0	344	22.9	6.7	23	40.2	2.1	57.8
05	258	10.3		17.0	358	48.6	6.7	23	42.3	1.9	57.9
06	273	10.5	S 6	17.9	13	14.3	6.6	N23	44.2	1.8	57.9
07	288	10.6		18.9	27	39.9	6.6	23	46.0	1.7	57.9
M 08	303	10.8		19.8	42	05.5	6.5	23	47.7	1.5	57.9
A 09	318	11.0	. .	20.8	56	31.0	6.5	23	49.2	1.4	58.0
R 10	333	11.2		21.7	70	56.5	6.5	23	50.6	1.2	58.0
11	348	11.3		22.7	85	22.0	6.3	23	51.8	1.1	58.0
T 12	3	11.5	S 6	23.6	99	47.3	6.4	N23	52.9	0.9	58.0
13	18	11.7		24.6	114	12.7	6.3	23	53.8	0.8	58.1
E 14	33	11.8		25.5	128	38.0	6.3	23	54.6	0.6	58.1
S 15	48	12.0	. .	26.5	143	03.3	6.2	23	55.2	0.5	58.1
16	63	12.2		27.4	157	28.5	6.2	23	55.7	0.3	58.2
17	78	12.3		28.4	171	53.7	6.1	23	56.0	0.2	58.2
18	93	12.5	S 6	29.3	186	18.8	6.1	N23	56.2	0.0	58.2
19	108	12.7		30.3	200	43.9	6.1	23	56.2	0.1	58.2
20	123	12.8		31.2	215	09.0	6.1	23	56.1	0.3	58.3
21	138	13.0	. .	32.2	229	34.1	6.0	23	55.8	0.4	58.3
22	153	13.2		33.1	243	59.1	6.0	23	55.4	0.6	58.3
23	168	13.4		34.1	258	24.1	5.9	N23	54.8	0.7	58.4
	SD	16.0	d	1.0	SD		15.5		15.6		15.8

Lat.	Crepúsculo Náutico	Crepúsculo Civil	Orto Sol	Orto Luna 7	Orto Luna 8	Orto Luna 9	Orto Luna 10
°	h m	h m	h m	h m	h m	h m	h m
N 72	04 24	05 43	06 51	▭	▭	▭	▭
N 70	04 31	05 42	06 44	▭	▭	▭	▭
68	04 37	05 42	06 38	17 00	▭	▭	▭
66	04 42	05 42	06 33	17 48	17 48	18 07	19 46
64	04 46	05 41	06 29	18 19	18 37	19 19	20 37
62	04 49	05 41	06 25	18 43	19 09	19 55	21 08
60	04 52	05 41	06 22	19 01	19 32	20 21	21 32
N 58	04 55	05 40	06 19	19 17	19 51	20 42	21 51
56	04 57	05 40	06 17	19 30	20 07	20 59	22 06
54	04 58	05 39	06 15	19 42	20 21	21 13	22 20
52	05 00	05 39	06 13	19 52	20 33	21 26	22 32
50	05 01	05 38	06 11	20 01	20 43	21 37	22 42
45	05 03	05 37	06 07	20 21	21 05	22 00	23 04
N 40	05 05	05 36	06 03	20 37	21 23	22 18	23 22
35	05 05	05 35	06 00	20 50	21 38	22 34	23 36
30	05 06	05 33	05 57	21 02	21 51	22 47	23 49
20	05 05	05 31	05 53	21 22	22 14	23 10	24 11
N 10	05 03	05 27	05 48	21 40	22 33	23 30	24 30
0	04 59	05 23	05 44	21 56	22 51	23 49	24 48
S 10	04 54	05 19	05 40	22 13	23 10	24 08	00 08
20	04 47	05 13	05 35	22 31	23 29	24 28	00 28
30	04 38	05 06	05 30	22 51	23 52	24 51	00 51
35	04 31	05 01	05 27	23 04	24 05	00 05	01 04
40	04 23	04 56	05 23	23 17	24 21	00 21	01 20
45	04 14	04 49	05 19	23 34	24 39	00 39	01 39
S 50	04 01	04 41	05 14	23 55	25 02	01 02	02 02
52	03 55	04 37	05 12	24 04	00 04	01 13	02 13
54	03 48	04 33	05 09	24 16	00 16	01 25	02 26
56	03 41	04 28	05 06	24 28	00 28	01 40	02 40
58	03 32	04 22	05 03	24 43	00 43	01 57	02 57
S 60	03 21	04 16	05 00	25 00	01 00	02 17	03 18

Lat.	Ocaso Sol	Crepúsculo Civil	Crepúsculo Náutico	Ocaso Luna 7	Ocaso Luna 8	Ocaso Luna 9	Ocaso Luna 10
°	h m	h m	h m	h m	h m	h m	h m
N 72	16 42	17 50	19 08	▭	▭	▭	▭
N 70	16 49	17 51	19 01	▭	▭	▭	▭
68	16 55	17 51	18 56	14 14	▭	▭	▭
66	17 00	17 52	18 51	13 27	15 20	17 01	17 24
64	17 05	17 52	18 47	12 56	14 31	15 48	16 33
62	17 08	17 53	18 44	12 34	14 00	15 12	16 01
60	17 12	17 53	18 41	12 15	13 37	14 46	15 37
N 58	17 14	17 54	18 39	12 00	13 18	14 26	15 18
56	17 17	17 54	18 37	11 47	13 02	14 09	15 02
54	17 19	17 55	18 36	11 36	12 49	13 54	14 49
52	17 21	17 55	18 34	11 26	12 37	13 42	14 37
50	17 23	17 56	18 33	11 18	12 27	13 31	14 26
45	17 28	17 57	18 31	10 59	12 05	13 08	14 04
N 40	17 31	17 58	18 30	10 44	11 48	12 49	13 46
35	17 34	18 00	18 29	10 31	11 33	12 34	13 30
30	17 37	18 01	18 29	10 20	11 20	12 20	13 17
20	17 42	18 04	18 30	10 01	10 59	11 57	12 55
N 10	17 47	18 08	18 32	09 44	10 40	11 37	12 35
0	17 51	18 12	18 36	09 29	10 22	11 19	12 17
S 10	17 55	18 16	18 41	09 13	10 05	11 00	11 59
20	18 00	18 22	18 48	08 57	09 46	10 40	11 39
30	18 05	18 30	18 58	08 38	09 24	10 17	11 16
35	18 09	18 34	19 05	08 27	09 12	10 03	11 03
40	18 12	18 40	19 13	08 15	08 57	09 48	10 47
45	18 17	18 47	19 23	08 00	08 40	09 29	10 29
S 50	18 22	18 55	19 35	07 42	08 19	09 06	10 05
52	18 24	18 59	19 41	07 34	08 09	08 55	09 54
54	18 27	19 04	19 48	07 24	07 57	08 42	09 42
56	18 30	19 09	19 56	07 14	07 44	08 28	09 27
58	18 33	19 14	20 06	07 02	07 29	08 11	09 10
S 60	18 37	19 21	20 16	06 48	07 12	07 50	08 50

Día	SOL E.T. (+) 00h	SOL E.T. (+) 12h	SOL Pas. Mer.	LUNA Pas. Mer. Sup.	LUNA Pas. Mer. Inf.	LUNA Edad	LUNA Fase
d	m s	m s	h m	h m	h m	d	%
7	12 04	12 12	11 48	03 17	15 42	20	77
8	12 21	12 29	11 48	04 09	16 37	21	68
9	12 37	12 46	11 47	05 05	17 34	22	58

T.U.	ARIES	VENUS −3.9		MARTE −0.2		JUPITER −2.3		SATURNO −0.1	
d h	A.H.G.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.
	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
10 00	18 39.8	204 19.8	N 4 00.8	88 31.3	S24 49.8	272 37.8	N22 27.5	304 55.1	N20 44.3
01	33 42.2	219 19.4	3 59.6	103 32.0	49.6	287 40.1	27.5	319 57.6	44.3
02	48 44.7	234 19.0	58.4	118 32.7	49.3	302 42.4	27.5	335 00.1	44.2
03	63 47.2	249 18.6	. . 57.2	133 33.5	. . 49.0	317 44.6	. . 27.5	350 02.7	. . 44.2
04	78 49.6	264 18.3	56.0	148 34.2	48.7	332 46.9	27.4	5 05.2	44.2
05	93 52.1	279 17.9	54.8	163 34.9	48.4	347 49.2	27.4	20 07.7	44.2
06	108 54.5	294 17.5	N 3 53.7	178 35.6	S24 48.1	2 51.4	N22 27.4	35 10.2	N20 44.2
07	123 57.0	309 17.1	52.5	193 36.4	47.9	17 53.7	27.4	50 12.8	44.2
08	138 59.5	324 16.7	51.3	208 37.1	47.6	32 56.0	27.4	65 15.3	44.2
09	154 01.9	339 16.3	. . 50.1	223 37.8	. . 47.3	47 58.2	. . 27.4	80 17.8	. . 44.2
10	169 04.4	354 15.9	48.9	238 38.5	47.0	63 00.5	27.3	95 20.3	44.2
11	184 06.9	9 15.5	47.7	253 39.3	46.7	78 02.7	27.3	110 22.9	44.1
12	199 09.3	24 15.1	N 3 46.5	268 40.0	S24 46.4	93 05.0	N22 27.3	125 25.4	N20 44.1
13	214 11.8	39 14.7	45.4	283 40.7	46.1	108 07.3	27.3	140 27.9	44.1
14	229 14.3	54 14.3	44.2	298 41.4	45.9	123 09.5	27.3	155 30.5	44.1
15	244 16.7	69 13.9	. . 43.0	313 42.1	. . 45.6	138 11.8	. . 27.3	170 33.0	. . 44.1
16	259 19.2	84 13.5	41.8	328 42.9	45.3	153 14.1	27.2	185 35.5	44.1
17	274 21.7	99 13.1	40.6	343 43.6	45.0	168 16.3	27.2	200 38.1	44.1
18	289 24.1	114 12.7	N 3 39.4	358 44.3	S24 44.7	183 18.6	N22 27.2	215 40.6	N20 44.1
19	304 26.6	129 12.3	38.2	13 45.0	44.4	198 20.9	27.2	230 43.1	44.1
20	319 29.0	144 11.9	37.0	28 45.8	44.1	213 23.2	27.2	245 45.6	44.0
21	334 31.5	159 11.5	. . 35.9	43 46.5	. . 43.8	228 25.4	. . 27.2	260 48.2	. . 44.0
22	349 34.0	174 11.2	34.7	58 47.2	43.5	243 27.7	27.1	275 50.7	44.0
23	4 36.4	189 10.8	33.5	73 47.9	43.3	258 30.0	27.1	290 53.2	44.0
11 00	19 38.9	204 10.4	N 3 32.3	88 48.6	S24 43.0	273 32.2	N22 27.1	305 55.8	N20 44.0
01	34 41.4	219 10.0	31.1	103 49.4	42.7	288 34.5	27.1	320 58.3	44.0
02	49 43.8	234 09.6	29.9	118 50.1	42.4	303 36.8	27.1	336 00.8	44.0
03	64 46.3	249 09.2	. . 28.7	133 50.8	. . 42.1	318 39.0	. . 27.1	351 03.4	. . 44.0
04	79 48.8	264 08.8	27.5	148 51.5	41.8	333 41.3	27.0	6 05.9	43.9
05	94 51.2	279 08.4	26.3	163 52.3	41.5	348 43.6	27.0	21 08.4	43.9
06	109 53.7	294 08.0	N 3 25.1	178 53.0	S24 41.2	3 45.9	N22 27.0	36 10.9	N20 43.9
07	124 56.1	309 07.6	24.0	193 53.7	40.9	18 48.1	27.0	51 13.5	43.9
08	139 58.6	324 07.2	22.8	208 54.4	40.6	33 50.4	27.0	66 16.0	43.9
09	155 01.1	339 06.8	. . 21.6	223 55.1	. . 40.3	48 52.7	. . 27.0	81 18.5	. . 43.9
10	170 03.5	354 06.4	20.4	238 55.9	40.0	63 54.9	26.9	96 21.1	43.9
11	185 06.0	9 06.0	19.2	253 56.6	39.7	78 57.2	26.9	111 23.6	43.9
12	200 08.5	24 05.6	N 3 18.0	268 57.3	S24 39.4	93 59.5	N22 26.9	126 26.1	N20 43.9
13	215 10.9	39 05.3	16.8	283 58.0	39.1	109 01.8	26.9	141 28.7	43.8
14	230 13.4	54 04.9	15.6	298 58.7	38.9	124 04.0	26.9	156 31.2	43.8
15	245 15.9	69 04.5	. . 14.4	313 59.4	. . 38.6	139 06.3	. . 26.9	171 33.7	. . 43.8
16	260 18.3	84 04.1	13.2	329 00.2	38.3	154 08.6	26.9	186 36.3	43.8
17	275 20.8	99 03.7	12.0	344 00.9	38.0	169 10.9	26.8	201 38.8	43.8
18	290 23.3	114 03.3	N 3 10.8	359 01.6	S24 37.7	184 13.1	N22 26.8	216 41.3	N20 43.8
19	305 25.7	129 02.9	09.6	14 02.3	37.4	199 15.4	26.8	231 43.9	43.8
20	320 28.2	144 02.5	08.5	29 03.0	37.1	214 17.7	26.8	246 46.4	43.8
21	335 30.6	159 02.1	. . 07.3	44 03.8	. . 36.8	229 20.0	. . 26.8	261 48.9	. . 43.7
22	350 33.1	174 01.7	06.1	59 04.5	36.5	244 22.3	26.8	276 51.5	43.7
23	5 35.6	189 01.3	04.9	74 05.2	36.2	259 24.5	26.7	291 54.0	43.7
12 00	20 38.0	204 00.9	N 3 03.7	89 05.9	S24 35.9	274 26.8	N22 26.7	306 56.6	N20 43.7
01	35 40.5	219 00.6	02.5	104 06.6	35.6	289 29.1	26.7	321 59.1	43.7
02	50 43.0	234 00.2	01.3	119 07.3	35.3	304 31.4	26.7	337 01.6	43.7
03	65 45.4	248 59.8	3 00.1	134 08.1	. . 35.0	319 33.6	. . 26.7	352 04.2	. . 43.7
04	80 47.9	263 59.4	2 58.9	149 08.8	34.7	334 35.9	26.7	7 06.7	43.7
05	95 50.4	278 59.0	57.7	164 09.5	34.4	349 38.2	26.7	22 09.2	43.7
06	110 52.8	293 58.6	N 2 56.5	179 10.2	S24 34.1	4 40.5	N22 26.6	37 11.8	N20 43.6
07	125 55.3	308 58.2	55.3	194 10.9	33.8	19 42.8	26.6	52 14.3	43.6
08	140 57.8	323 57.8	54.1	209 11.6	33.5	34 45.0	26.6	67 16.8	43.6
09	156 00.2	338 57.4	. . 52.9	224 12.3	. . 33.2	49 47.3	. . 26.6	82 19.4	. . 43.6
10	171 02.7	353 57.0	51.7	239 13.1	32.9	64 49.6	26.6	97 21.9	43.6
11	186 05.1	8 56.6	50.5	254 13.8	32.6	79 51.9	26.6	112 24.5	43.6
12	201 07.6	23 56.2	N 2 49.3	269 14.5	S24 32.3	94 54.2	N22 26.5	127 27.0	N20 43.6
13	216 10.1	38 55.9	48.1	284 15.2	32.0	109 56.4	26.5	142 29.5	43.6
14	231 12.5	53 55.5	46.9	299 15.9	31.7	124 58.7	26.5	157 32.1	43.5
15	246 15.0	68 55.1	. . 45.7	314 16.6	. . 31.4	140 01.0	. . 26.5	172 34.6	. . 43.5
16	261 17.5	83 54.7	44.5	329 17.3	31.0	155 03.3	26.5	187 37.1	43.5
17	276 19.9	98 54.3	43.3	344 18.1	30.7	170 05.6	26.5	202 39.7	43.5
18	291 22.4	113 53.9	N 2 42.1	359 18.8	S24 30.4	185 07.9	N22 26.5	217 42.2	N20 43.5
19	306 24.9	128 53.5	40.9	14 19.5	30.1	200 10.1	26.4	232 44.8	43.5
20	321 27.3	143 53.1	39.7	29 20.2	29.8	215 12.4	26.4	247 47.3	43.5
21	336 29.8	158 52.7	. . 38.5	44 20.9	. . 29.5	230 14.7	. . 26.4	262 49.8	. . 43.5
22	351 32.3	173 52.3	37.3	59 21.6	29.2	245 17.0	26.4	277 52.4	43.4
23	6 34.7	188 51.9	36.1	74 22.3	28.9	260 19.3	26.4	292 54.9	43.4
	h m								
Pas. Mer.	22 37.7	v −0.4	d 1.2	v 0.7	d 0.3	v 2.3	d 0.0	v 2.5	d 0.0

ESTRELLAS

Nombre	A.H.S.	Dec.
	° ′	° ′
Acamar	315 24.9	S40 17.8
Achernar	335 32.9	S57 13.7
Acrux	173 20.5	S63 06.3
Adhara	255 19.7	S28 58.2
Aldebaran	290 59.7	N16 30.8
Alioth	166 29.2	N55 57.2
Alkaid	153 06.5	N49 18.5
Al Na'ir	27 54.9	S46 57.3
Alnilam	275 55.6	S 1 11.9
Alphard	218 05.3	S 8 39.7
Alphecca	126 19.1	N26 42.8
Alpheratz	357 52.7	N29 06.1
Altair	62 17.2	N 8 52.5
Ankaa	353 24.3	S42 17.9
Antares	112 37.8	S26 26.1
Arcturus	146 04.4	N19 10.6
Atria	107 48.3	S69 02.0
Avior	234 22.0	S59 30.5
Bellatrix	278 41.7	N 6 21.2
Betelgeuse	271 11.2	N 7 24.5
Canopus	264 00.1	S52 41.5
Capella	280 47.8	N45 59.9
Deneb	49 37.6	N45 17.4
Denebola	182 43.3	N14 33.9
Diphda	349 04.8	S17 58.6
Dubhe	194 03.3	N61 44.5
Elnath	278 24.1	N28 36.5
Eltanin	90 50.6	N51 29.6
Enif	33 56.0	N 9 53.1
Fomalhaut	15 33.8	S29 36.9
Gacrux	172 11.9	S57 07.1
Gienah	176 02.1	S17 32.8
Hadar	149 01.8	S60 22.8
Hamal	328 10.9	N23 28.2
Kaus Aust.	83 56.1	S34 23.1
Kochab	137 20.5	N74 09.1
Markab	13 47.3	N15 12.9
Menkar	314 24.4	N 4 05.8
Menkent	148 18.9	S36 22.6
Miaplacidus	221 42.2	S69 43.1
Mirfak	308 53.2	N49 51.9
Nunki	76 09.7	S26 17.7
Peacock	53 33.5	S56 44.0
Pollux	243 39.0	N28 01.3
Procyon	245 09.4	N 5 13.4
Rasalhague	96 15.1	N12 33.7
Regulus	207 53.5	N11 57.7
Rigel	281 20.7	S 8 11.8
Rigil Kent.	140 05.2	S60 50.5
Sabik	102 23.3	S15 43.5
Schedar	349 50.6	N56 32.8
Shaula	96 34.6	S37 06.4
Sirius	258 41.8	S16 42.9
Spica	158 41.3	S11 10.0
Suhail	222 59.5	S43 26.0
Vega	80 45.3	N38 47.4
Zuben'ubi	137 15.9	S16 02.8

	A.H.S.	Pas. Mer.
	° ′	h m
Venus	184 31.5	10 24
Marte	69 09.7	18 04
Júpiter	253 53.3	5 45
Saturno	286 16.9	3 36

T.U.	SOL			LUNA				
	A.H.G.	Dec.		A.H.G.	v	Dec.	d	P.H.
d h	° ′	° ′		° ′	′	° ′	′	′
10 00	183 13.5	S 6 35.0		272 49.0	5.9	N23 54.1	0.9	58.4
01	198 13.7	36.0		287 13.9	5.9	23 53.2	1.0	58.4
02	213 13.9	36.9		301 38.8	5.9	23 52.2	1.2	58.4
03	228 14.0	. . 37.9		316 03.7	5.9	23 51.0	1.3	58.5
04	243 14.2	38.8		330 28.6	5.8	23 49.7	1.5	58.5
05	258 14.4	39.8		344 53.4	5.8	23 48.2	1.6	58.5
06	273 14.5	S 6 40.7		359 18.2	5.8	N23 46.6	1.8	58.5
M 07	288 14.7	41.6		13 43.0	5.8	23 44.8	2.0	58.6
I 08	303 14.8	42.6		28 07.8	5.7	23 42.8	2.1	58.6
E 09	318 15.0	. . 43.5		42 32.5	5.8	23 40.7	2.3	58.6
R 10	333 15.2	44.5		56 57.3	5.7	23 38.4	2.4	58.7
C 11	348 15.3	45.4		71 22.0	5.7	23 36.0	2.5	58.7
O 12	3 15.5	S 6 46.4		85 46.7	5.7	N23 33.5	2.8	58.7
L 13	18 15.7	47.3		100 11.4	5.7	23 30.7	2.8	58.7
14	33 15.8	48.3		114 36.1	5.7	23 27.9	3.1	58.8
E 15	48 16.0	. . 49.2		129 00.8	5.7	23 24.8	3.2	58.8
S 16	63 16.2	50.2		143 25.5	5.7	23 21.6	3.3	58.8
17	78 16.3	51.1		157 50.2	5.7	23 18.3	3.5	58.8
18	93 16.5	S 6 52.0		172 14.9	5.7	N23 14.8	3.6	58.9
19	108 16.7	53.0		186 39.6	5.6	23 11.2	3.8	58.9
20	123 16.8	53.9		201 04.2	5.7	23 07.4	4.0	58.9
21	138 17.0	. . 54.9		215 28.9	5.7	23 03.4	4.1	59.0
22	153 17.1	55.8		229 53.6	5.7	22 59.3	4.3	59.0
23	168 17.3	56.8		244 18.3	5.7	22 55.0	4.4	59.0
11 00	183 17.5	S 6 57.7		258 43.0	5.7	N22 50.6	4.6	59.0
01	198 17.6	58.6		273 07.7	5.7	22 46.0	4.7	59.1
02	213 17.8	6 59.6		287 32.4	5.7	22 41.3	4.9	59.1
03	228 18.0	7 00.5		301 57.1	5.7	22 36.4	5.0	59.1
04	243 18.1	01.5		316 21.8	5.8	22 31.4	5.2	59.1
05	258 18.3	02.4		330 46.6	5.7	22 26.2	5.3	59.2
06	273 18.4	S 7 03.4		345 11.3	5.8	N22 20.9	5.5	59.2
07	288 18.6	04.3		359 36.1	5.8	22 15.4	5.6	59.2
J 08	303 18.8	05.2		14 00.9	5.8	22 09.8	5.8	59.2
U 09	318 18.9	. . 06.2		28 25.7	5.8	22 04.0	5.9	59.3
E 10	333 19.1	07.1		42 50.5	5.8	21 58.1	6.1	59.3
V 11	348 19.2	08.1		57 15.3	5.8	21 52.0	6.2	59.3
E 12	3 19.4	S 7 09.0		71 40.1	5.9	N21 45.8	6.4	59.3
13	18 19.6	10.0		86 05.0	5.9	21 39.4	6.5	59.4
S 14	33 19.7	10.9		100 29.9	5.9	21 32.9	6.6	59.4
15	48 19.9	. . 11.8		114 54.8	6.0	21 26.3	6.8	59.4
16	63 20.0	12.8		129 19.8	5.9	21 19.5	7.0	59.4
17	78 20.2	13.7		143 44.7	6.0	21 12.5	7.1	59.5
18	93 20.3	S 7 14.7		158 09.7	6.1	N21 05.4	7.2	59.5
19	108 20.5	15.6		172 34.8	6.0	20 58.2	7.4	59.5
20	123 20.7	16.5		186 59.8	6.1	20 50.8	7.6	59.5
21	138 20.8	. . 17.5		201 24.9	6.1	20 43.2	7.6	59.6
22	153 21.0	18.4		215 50.0	6.2	20 35.6	7.8	59.6
23	168 21.1	19.4		230 15.2	6.1	20 27.8	8.0	59.6
12 00	183 21.3	S 7 20.3		244 40.3	6.2	N20 19.8	8.1	59.6
01	198 21.4	21.2		259 05.5	6.3	20 11.7	8.2	59.7
02	213 21.6	22.2		273 30.8	6.2	20 03.5	8.3	59.7
03	228 21.8	. . 23.1		287 56.0	6.4	19 55.2	8.5	59.7
04	243 21.9	24.1		302 21.4	6.3	19 46.7	8.7	59.7
05	258 22.1	25.0		316 46.7	6.4	19 38.0	8.7	59.8
06	273 22.2	S 7 25.9		331 12.1	6.4	N19 29.3	8.9	59.8
07	288 22.4	26.9		345 37.5	6.5	19 20.4	9.1	59.8
V 08	303 22.5	27.8		0 03.0	6.5	19 11.3	9.1	59.8
I 09	318 22.7	. . 28.8		14 28.5	6.5	19 02.2	9.3	59.8
E 10	333 22.8	29.7		28 54.0	6.6	18 52.9	9.4	59.9
R 11	348 23.0	30.6		43 19.6	6.6	18 43.5	9.6	59.9
N 12	3 23.2	S 7 31.6		57 45.2	6.7	N18 33.9	9.7	59.9
E 13	18 23.3	32.5		72 10.9	6.7	18 24.2	9.8	59.9
S 14	33 23.5	33.4		86 36.6	6.7	18 14.4	9.9	60.0
15	48 23.6	. . 34.4		101 02.3	6.8	18 04.5	10.0	60.0
16	63 23.8	35.3		115 28.1	6.8	17 54.5	10.2	60.0
17	78 23.9	36.3		129 53.9	6.9	17 44.3	10.3	60.0
18	93 24.1	S 7 37.2		144 19.8	6.9	N17 34.0	10.4	60.0
19	108 24.2	38.1		158 45.7	6.9	17 23.6	10.5	60.1
20	123 24.4	39.1		173 11.6	7.0	17 13.1	10.7	60.1
21	138 24.5	. . 40.0		187 37.6	7.1	17 02.4	10.7	60.1
22	153 24.7	40.9		202 03.7	7.1	16 51.7	10.9	60.1
23	168 24.8	41.9		216 29.8	7.1	N16 40.8	11.0	60.1
	SD 16.0	d 0.9		SD	16.0	16.2		16.3

Lat.	Crepúsculo Náutico	Crepúsculo Civil	Orto Sol	Orto Luna 10	Orto Luna 11	Orto Luna 12	Orto Luna 13
°	h m	h m	h m	h m	h m	h m	h m
N 72	04 37	05 56	07 05	▭	▭	22 02	25 02
N 70	04 43	05 54	06 56	▭	▭	22 55	25 22
68	04 48	05 53	06 49	▭	21 02	23 28	25 37
66	04 52	05 51	06 43	19 46	21 49	23 51	25 50
64	04 55	05 50	06 38	20 37	22 19	24 09	00 09
62	04 57	05 49	06 33	21 08	22 41	24 24	00 24
60	04 59	05 48	06 29	21 32	23 00	24 37	00 37
N 58	05 01	05 47	06 26	21 51	23 15	24 48	00 48
56	05 03	05 46	06 23	22 06	23 28	24 57	00 57
54	05 04	05 45	06 20	22 20	23 39	25 05	01 05
52	05 05	05 44	06 18	22 32	23 49	25 12	01 12
50	05 06	05 43	06 15	22 42	23 58	25 19	01 19
45	05 07	05 41	06 10	23 04	24 16	00 16	01 33
N 40	05 08	05 39	06 06	23 22	24 31	00 31	01 45
35	05 08	05 37	06 03	23 36	24 44	00 44	01 55
30	05 08	05 35	05 59	23 49	24 55	00 55	02 03
20	05 06	05 31	05 54	24 11	00 11	01 14	02 18
N 10	05 03	05 27	05 48	24 30	00 30	01 31	02 31
0	04 58	05 23	05 43	24 48	00 48	01 46	02 43
S 10	04 53	05 17	05 38	00 08	01 05	02 01	02 55
20	04 45	05 11	05 33	00 28	01 24	02 18	03 08
30	04 34	05 02	05 27	00 51	01 46	02 37	03 22
35	04 27	04 57	05 23	01 04	01 59	02 48	03 31
40	04 18	04 51	05 19	01 20	02 13	03 00	03 40
45	04 08	04 44	05 14	01 39	02 31	03 15	03 52
S 50	03 54	04 34	05 08	02 02	02 52	03 33	04 05
52	03 47	04 30	05 05	02 13	03 02	03 41	04 11
54	03 40	04 25	05 02	02 26	03 14	03 50	04 18
56	03 31	04 20	04 58	02 40	03 27	04 01	04 26
58	03 22	04 13	04 55	02 57	03 42	04 13	04 34
S 60	03 10	04 06	04 51	03 18	04 00	04 27	04 44

Lat.	Ocaso Sol	Crepúsculo Civil	Crepúsculo Náutico	Ocaso Luna 10	Ocaso Luna 11	Ocaso Luna 12	Ocaso Luna 13
°	h m	h m	h m	h m	h m	h m	h m
N 72	16 27	17 35	18 53	▭	▭	19 14	18 12
N 70	16 36	17 37	18 48	▭	▭	18 20	17 50
68	16 43	17 39	18 43	▭	18 12	17 46	17 33
66	16 49	17 41	18 40	17 24	17 24	17 22	17 18
64	16 54	17 42	18 37	16 33	16 53	17 02	17 07
62	16 59	17 43	18 34	16 01	16 30	16 46	16 57
60	17 03	17 45	18 32	15 37	16 11	16 33	16 48
N 58	17 06	17 46	18 31	15 18	15 56	16 22	16 40
56	17 09	17 47	18 30	15 02	15 42	16 11	16 33
54	17 12	17 48	18 28	14 49	15 31	16 03	16 27
52	17 15	17 49	18 28	14 37	15 20	15 55	16 22
50	17 17	17 50	18 27	14 26	15 11	15 47	16 17
45	17 22	17 52	18 26	14 04	14 52	15 32	16 06
N 40	17 27	17 54	18 25	13 46	14 36	15 19	15 57
35	17 30	17 56	18 25	13 30	14 22	15 08	15 49
30	17 34	17 58	18 25	13 17	14 10	14 58	15 42
20	17 40	18 02	18 27	12 55	13 50	14 42	15 30
N 10	17 45	18 06	18 31	12 35	13 32	14 27	15 19
0	17 50	18 11	18 35	12 17	13 16	14 13	15 09
S 10	17 55	18 16	18 41	11 59	12 59	14 00	14 59
20	18 01	18 23	18 49	11 39	12 41	13 45	14 48
30	18 07	18 32	19 00	11 16	12 20	13 27	14 36
35	18 11	18 37	19 07	11 03	12 08	13 17	14 29
40	18 16	18 43	19 16	10 47	11 54	13 06	14 20
45	18 21	18 51	19 27	10 29	11 37	12 52	14 10
S 50	18 27	19 00	19 41	10 05	11 16	12 35	13 59
52	18 30	19 05	19 48	09 54	11 06	12 27	13 53
54	18 33	19 10	19 55	09 42	10 55	12 19	13 47
56	18 36	19 15	20 04	09 27	10 43	12 09	13 40
58	18 40	19 22	20 14	09 10	10 28	11 57	13 32
S 60	18 45	19 29	20 26	08 50	10 10	11 44	13 23

Día	SOL E.T. (+) 00h	SOL E.T. (+) 12h	SOL Pas. Mer.	LUNA Pas. Mer. Sup.	LUNA Pas. Mer. Inf.	LUNA Edad	LUNA Fase
d	m s	m s	h m	h m	h m	c	%
10	12 54	13 02	11 47	06 03	18 32	23	47
11	13 10	13 17	11 47	07 02	19 31	24	35
12	13 25	13 32	11 46	08 00	20 28	25	25

T.U.	ARIES	VENUS −3.9		MARTE −0.2		JUPITER −2.3		SATURNO −0.1	
d h	A.H.G.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.
	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
13 00	21 37.2	203 51.5	N 2 34.9	89 23.1	S24 28.6	275 21.6	N22 26.4	307 57.5	N20 43.4
01	36 39.6	218 51.2	33.7	104 23.8	28.3	290 23.9	26.4	323 00.0	43.4
02	51 42.1	233 50.8	32.5	119 24.5	28.0	305 26.1	26.3	338 02.5	43.4
03	66 44.6	248 50.4 . .	31.3	134 25.2 . .	27.7	320 28.4 . .	26.3	353 05.1 . .	43.4
04	81 47.0	263 50.0	30.1	149 25.9	27.4	335 30.7	26.3	8 07.6	43.4
05	96 49.5	278 49.6	28.9	164 26.6	27.1	350 33.0	26.3	23 10.2	43.4
06	111 52.0	293 49.2	N 2 27.7	179 27.3	S24 26.7	5 35.3	N22 26.3	38 12.7	N20 43.4
S 07	126 54.4	308 48.8	26.5	194 28.0	26.4	20 37.6	26.3	53 15.2	43.3
08	141 56.9	323 48.4	25.3	209 28.7	26.1	35 39.9	26.3	68 17.8	43.3
A 09	156 59.4	338 48.0 . .	24.1	224 29.5 . .	25.8	50 42.2 . .	26.2	83 20.3 . .	43.3
10	172 01.8	353 47.6	22.9	239 30.2	25.5	65 44.5	26.2	98 22.9	43.3
B 11	187 04.3	8 47.3	21.7	254 30.9	25.2	80 46.7	26.2	113 25.4	43.3
A 12	202 06.7	23 46.9	N 2 20.5	269 31.6	S24 24.9	95 49.0	N22 26.2	128 28.0	N20 43.3
13	217 09.2	38 46.5	19.3	284 32.3	24.6	110 51.3	26.2	143 30.5	43.3
D 14	232 11.7	53 46.1	18.1	299 33.0	24.3	125 53.6	26.2	158 33.0	43.3
15	247 14.1	68 45.7 . .	16.9	314 33.7 . .	23.9	140 55.9 . .	26.2	173 35.6 . .	43.2
O 16	262 16.6	83 45.3	15.7	329 34.4	23.6	155 58.2	26.1	188 38.1	43.2
17	277 19.1	98 44.9	14.5	344 35.1	23.3	171 00.5	26.1	203 40.7	43.2
18	292 21.5	113 44.5	N 2 13.3	359 35.8	S24 23.0	186 02.8	N22 26.1	218 43.2	N20 43.2
19	307 24.0	128 44.1	12.1	14 36.6	22.7	201 05.1	26.1	233 45.8	43.2
20	322 26.5	143 43.7	10.9	29 37.3	22.4	216 07.4	26.1	248 48.3	43.2
21	337 28.9	158 43.4 . .	09.7	44 38.0 . .	22.1	231 09.7 . .	26.1	263 50.8 . .	43.2
22	352 31.4	173 43.0	08.5	59 38.7	21.7	246 11.9	26.1	278 53.4	43.2
23	7 33.9	188 42.6	07.3	74 39.4	21.4	261 14.2	26.0	293 55.9	43.1
14 00	22 36.3	203 42.2	N 2 06.1	89 40.1	S24 21.1	276 16.5	N22 26.0	308 58.5	N20 43.1
01	37 38.8	218 41.8	04.9	104 40.8	20.8	291 18.8	26.0	324 01.0	43.1
02	52 41.2	233 41.4	03.7	119 41.5	20.5	306 21.1	26.0	339 03.6	43.1
03	67 43.7	248 41.0 . .	02.5	134 42.2 . .	20.2	321 23.4 . .	26.0	354 06.1 . .	43.1
04	82 46.2	263 40.6	01.3	149 42.9	19.9	336 25.7	26.0	9 08.7	43.1
05	97 48.6	278 40.2	2 00.1	164 43.6	19.5	351 28.0	26.0	24 11.2	43.1
06	112 51.1	293 39.8	N 1 58.9	179 44.3	S24 19.2	6 30.3	N22 25.9	39 13.8	N20 43.0
D 07	127 53.6	308 39.5	57.7	194 45.0	18.9	21 32.6	25.9	54 16.3	43.0
08	142 56.0	323 39.1	56.5	209 45.8	18.6	36 34.9	25.9	69 18.8	43.0
O 09	157 58.5	338 38.7 . .	55.3	224 46.5 . .	18.3	51 37.2 . .	25.9	84 21.4 . .	43.0
M 10	173 01.0	353 38.3	54.1	239 47.2	17.9	66 39.5	25.9	99 23.9	43.0
11	188 03.4	8 37.9	52.9	254 47.9	17.6	81 41.8	25.9	114 26.5	43.0
I 12	203 05.9	23 37.5	N 1 51.7	269 48.6	S24 17.3	96 44.1	N22 25.9	129 29.0	N20 43.0
N 13	218 08.3	38 37.1	50.5	284 49.3	17.0	111 46.4	25.9	144 31.6	43.0
G 14	233 10.8	53 36.7	49.2	299 50.0	16.7	126 48.7	25.8	159 34.1	42.9
O 15	248 13.3	68 36.3 . .	48.0	314 50.7 . .	16.3	141 51.0 . .	25.8	174 36.7 . .	42.9
16	263 15.7	83 35.9	46.8	329 51.4	16.0	156 53.3	25.8	189 39.2	42.9
17	278 18.2	98 35.6	45.6	344 52.1	15.7	171 55.6	25.8	204 41.8	42.9
18	293 20.7	113 35.2	N 1 44.4	359 52.8	S24 15.4	186 57.9	N22 25.8	219 44.3	N20 42.9
19	308 23.1	128 34.8	43.2	14 53.5	15.1	202 00.2	25.8	234 46.9	42.9
20	323 25.6	143 34.4	42.0	29 54.2	14.7	217 02.5	25.8	249 49.4	42.9
21	338 28.1	158 34.0 . .	40.8	44 54.9 . .	14.4	232 04.8 . .	25.7	264 52.0 . .	42.9
22	353 30.5	173 33.6	39.6	59 55.6	14.1	247 07.1	25.7	279 54.5	42.8
23	8 33.0	188 33.2	38.4	74 56.3	13.8	262 09.4	25.7	294 57.1	42.8
15 00	23 35.5	203 32.8	N 1 37.2	89 57.0	S24 13.4	277 11.7	N22 25.7	309 59.6	N20 42.8
01	38 37.9	218 32.4	36.0	104 57.7	13.1	292 14.0	25.7	325 02.2	42.8
02	53 40.4	233 32.0	34.8	119 58.4	12.8	307 16.3	25.7	340 04.7	42.8
03	68 42.8	248 31.7 . .	33.6	134 59.2 . .	12.5	322 18.6 . .	25.7	355 07.3 . .	42.8
04	83 45.3	263 31.3	32.3	149 59.9	12.1	337 20.9	25.7	10 09.8	42.8
05	98 47.8	278 30.9	31.1	165 00.6	11.8	352 23.2	25.6	25 12.4	42.7
06	113 50.2	293 30.5	N 1 29.9	180 01.3	S24 11.5	7 25.5	N22 25.6	40 14.9	N20 42.7
07	128 52.7	308 30.1	28.7	195 02.0	11.2	22 27.8	25.6	55 17.5	42.7
L 08	143 55.2	323 29.7	27.5	210 02.7	10.8	37 30.1	25.6	70 20.0	42.7
U 09	158 57.6	338 29.3 . .	26.3	225 03.4 . .	10.5	52 32.4 . .	25.6	85 22.6 . .	42.7
10	174 00.1	353 28.9	25.1	240 04.1	10.2	67 34.7	25.6	100 25.1	42.7
11	189 02.6	8 28.5	23.9	255 04.8	09.8	82 37.0	25.6	115 27.7	42.7
N 12	204 05.0	23 28.2	N 1 22.7	270 05.5	S24 09.5	97 39.3	N22 25.6	130 30.2	N20 42.7
E 13	219 07.5	38 27.8	21.5	285 06.2	09.2	112 41.7	25.5	145 32.8	42.6
14	234 09.9	53 27.4	20.3	300 06.9	08.9	127 44.0	25.5	160 35.3	42.6
S 15	249 12.4	68 27.0 . .	19.1	315 07.6 . .	08.5	142 46.3 . .	25.5	175 37.9 . .	42.6
16	264 14.9	83 26.6	17.8	330 08.3	08.2	157 48.6	25.5	190 40.4	42.6
17	279 17.3	98 26.2	16.6	345 09.0	07.9	172 50.9	25.5	205 43.0	42.6
18	294 19.8	113 25.8	N 1 15.4	0 09.7	S24 07.5	187 53.2	N22 25.5	220 45.5	N20 42.6
19	309 22.3	128 25.4	14.2	15 10.4	07.2	202 55.5	25.5	235 48.1	42.6
20	324 24.7	143 25.0	13.0	30 11.1	06.9	217 57.8	25.5	250 50.6	42.5
21	339 27.2	158 24.7 . .	11.8	45 11.8 . .	06.6	233 00.1 . .	25.4	265 53.2 . .	42.5
22	354 29.7	173 24.3	10.6	60 12.5	06.2	248 02.4	25.4	280 55.7	42.5
23	9 32.1	188 23.9	09.4	75 13.2	05.9	263 04.7	25.4	295 58.3	42.5
	h m								
Pas. Mer.	22 25.9	v −0.4	d 1.2	v 0.7	d 0.3	v 2.3	d 0.0	v 2.5	d 0.0

ESTRELLAS

Nombre	A.H.S.		Dec.	
	°	′	°	′
Acamar	315	24.9	S40	17.8
Achernar	335	32.9	S57	13.7
Acrux	173	20.5	S63	06.3
Adhara	255	19.7	S28	58.2
Aldebaran	290	59.7	N16	30.8
Alioth	166	29.2	N55	57.1
Alkaid	153	06.5	N49	18.5
Al Na'ir	27	54.9	S46	57.3
Alnilam	275	55.6	S 1	11.9
Alphard	218	05.3	S 8	39.7
Alphecca	126	19.1	N26	42.8
Alpheratz	357	52.7	N29	06.1
Altair	62	17.2	N 8	52.5
Ankaa	353	24.3	S42	17.9
Antares	112	37.8	S26	26.1
Arcturus	146	04.4	N19	10.6
Atria	107	48.4	S69	02.0
Avior	234	22.0	S59	30.5
Bellatrix	278	41.7	N 6	21.2
Betelgeuse	271	11.1	N 7	24.5
Canopus	264	00.1	S52	41.5
Capella	280	47.8	N45	59.9
Deneb	49	37.7	N45	17.4
Denebola	182	43.3	N14	33.9
Diphda	349	04.8	S17	58.6
Dubhe	194	03.3	N61	44.5
Elnath	278	24.1	N28	36.5
Eltanin	90	50.6	N51	29.6
Enif	33	56.0	N 9	53.1
Fomalhaut	15	33.8	S29	36.9
Gacrux	172	11.9	S57	07.1
Gienah	176	02.1	S17	32.8
Hadar	149	01.8	S60	22.8
Hamal	328	10.8	N23	28.2
Kaus Aust.	83	56.1	S34	23.1
Kochab	137	20.5	N74	09.1
Markab	13	47.3	N15	12.9
Menkar	314	24.4	N 4	05.8
Menkent	148	18.9	S36	22.5
Miaplacidus	221	42.2	S69	43.1
Mirfak	308	53.2	N49	51.9
Nunki	76	09.8	S26	17.7
Peacock	53	33.5	S56	44.0
Pollux	243	39.0	N28	01.3
Procyon	245	09.4	N 5	13.4
Rasalhague	96	15.2	N12	33.7
Regulus	207	53.5	N11	57.7
Rigel	281	20.7	S 8	11.8
Rigil Kent.	140	05.2	S60	50.4
Sabik	102	23.3	S15	43.5
Schedar	349	50.6	N56	32.8
Shaula	96	34.6	S37	06.4
Sirius	258	41.8	S16	42.9
Spica	158	41.3	S11	10.0
Suhail	222	59.4	S43	26.0
Vega	80	45.3	N38	47.4
Zuben'ubi	137	16.0	S16	02.8

	A.H.S.		Pas. Mer.	
	°	′	h	m
Venus	181	05.9	10	25
Marte	67	03.8	18	00
Júpiter	253	40.2	5	34
Saturno	286	22.2	3	24

T.U.	SOL			LUNA				
	A.H.G.	Dec.		A.H.G.	v	Dec.	d	P.H.
d h	° ′	° ′		° ′	′	° ′	′	′
13 00	183 25.0	S 7 42.8		230 55.9	7.2	N16 29.8	11.1	60.1
01	198 25.1	43.7		245 22.1	7.2	16 18.7	11.2	60.2
02	213 25.3	44.7		259 48.3	7.3	16 07.5	11.3	60.2
03	228 25.4	. . 45.6		274 14.6	7.3	15 56.2	11.5	60.2
04	243 25.6	46.5		288 40.9	7.4	15 44.7	11.5	60.2
05	258 25.7	47.5		303 07.3	7.4	15 33.2	11.6	60.2
06	273 25.9	S 7 48.4		317 33.7	7.4	N15 21.6	11.8	60.2
07	288 26.0	49.3		332 00.1	7.5	15 09.8	11.8	60.3
S 08	303 26.2	50.3		346 26.6	7.5	14 58.0	12.0	60.3
A 09	318 26.3	. . 51.2		0 53.1	7.6	14 46.0	12.0	60.3
10	333 26.5	52.1		15 19.7	7.7	14 34.0	12.2	60.3
B 11	348 26.6	53.1		29 46.4	7.6	14 21.8	12.2	60.3
A 12	3 26.8	S 7 54.0		44 13.0	7.8	N14 09.6	12.4	60.3
13	18 26.9	54.9		58 39.8	7.7	13 57.2	12.4	60.4
D 14	33 27.1	55.9		73 06.5	7.9	13 44.8	12.5	60.4
15	48 27.2	. . 56.8		87 33.4	7.8	13 32.3	12.6	60.4
O 16	63 27.4	57.7		102 00.2	7.9	13 19.7	12.7	60.4
17	78 27.5	58.7		116 27.1	8.0	13 07.0	12.8	60.4
18	93 27.7	S 7 59.6		130 54.1	8.0	N12 54.2	12.9	60.4
19	108 27.8	8 00.5		145 21.1	8.0	12 41.3	13.0	60.4
20	123 28.0	01.5		159 48.1	8.1	12 28.3	13.0	60.4
21	138 28.1	. . 02.4		174 15.2	8.1	12 15.3	13.1	60.5
22	153 28.3	03.3		188 42.3	8.2	12 02.2	13.3	60.5
23	168 28.4	04.3		203 09.5	8.2	11 48.9	13.2	60.5
14 00	183 28.5	S 8 05.2		217 36.7	8.2	N11 35.7	13.4	60.5
01	198 28.7	06.1		232 03.9	8.3	11 22.3	13.4	60.5
02	213 28.8	07.1		246 31.2	8.3	11 08.9	13.5	60.5
03	228 29.0	. . 08.0		260 58.5	8.4	10 55.4	13.6	60.5
04	243 29.1	08.9		275 25.9	8.4	10 41.8	13.7	60.5
05	258 29.3	09.8		289 53.3	8.5	10 28.1	13.7	60.5
06	273 29.4	S 8 10.8		304 20.8	8.5	N10 14.4	13.8	60.5
D 07	288 29.6	11.7		318 48.3	8.5	10 00.6	13.8	60.5
O 08	303 29.7	12.6		333 15.8	8.6	9 46.8	14.0	60.5
M 09	318 29.8	. . 13.6		347 43.4	8.6	9 32.8	13.9	60.6
I 10	333 30.0	14.5		2 11.0	8.7	9 18.9	14.1	60.6
11	348 30.1	15.4		16 38.7	8.6	9 04.8	14.1	60.6
N 12	3 30.3	S 8 16.4		31 06.3	8.8	N 8 50.7	14.1	60.6
G 13	18 30.4	17.3		45 34.1	8.7	8 36.6	14.2	60.6
14	33 30.6	18.2		60 01.8	8.8	8 22.4	14.3	60.6
O 15	48 30.7	. . 19.1		74 29.6	8.9	8 08.1	14.3	60.6
16	63 30.8	20.1		88 57.5	8.8	7 53.8	14.4	60.6
17	78 31.0	21.0		103 25.3	8.9	7 39.4	14.4	60.6
18	93 31.1	S 8 21.9		117 53.2	9.0	N 7 25.0	14.5	60.6
19	108 31.3	22.8		132 21.2	8.9	7 10.5	14.5	60.6
20	123 31.4	23.8		146 49.1	9.0	6 56.0	14.5	60.6
21	138 31.5	. . 24.7		161 17.1	9.1	6 41.5	14.6	60.6
22	153 31.7	25.6		175 45.2	9.0	6 26.9	14.6	60.6
23	168 31.8	26.6		190 13.2	9.1	6 12.3	14.7	60.6
15 00	183 32.0	S 8 27.5		204 41.3	9.1	N 5 57.6	14.7	60.6
01	198 32.1	28.4		219 09.4	9.2	5 42.9	14.7	60.6
02	213 32.2	29.3		233 37.6	9.1	5 28.2	14.8	60.6
03	228 32.4	. . 30.3		248 05.7	9.3	5 13.4	14.8	60.6
04	243 32.5	31.2		262 34.0	9.2	4 58.6	14.8	60.6
05	258 32.7	32.1		277 02.2	9.2	4 43.8	14.9	60.6
06	273 32.8	S 8 33.0		291 30.4	9.3	N 4 28.9	14.9	60.6
07	288 32.9	34.0		305 58.7	9.3	4 14.0	14.9	60.6
L 08	303 33.1	34.9		320 27.0	9.4	3 59.1	14.9	60.6
U 09	318 33.2	. . 35.8		334 55.4	9.3	3 44.2	15.0	60.6
10	333 33.4	36.7		349 23.7	9.4	3 29.2	15.0	60.6
N 11	348 33.5	37.7		3 52.1	9.4	3 14.2	15.0	60.6
12	3 33.6	S 8 38.6		18 20.5	9.4	N 2 59.2	15.0	60.6
E 13	18 33.8	39.5		32 48.9	9.4	2 44.2	15.0	60.6
14	33 33.9	40.4		47 17.3	9.5	2 29.2	15.0	60.5
S 15	48 34.0	. . 41.3		61 45.8	9.5	2 14.2	15.1	60.5
16	63 34.2	42.3		76 14.3	9.5	1 59.1	15.0	60.5
17	78 34.3	43.2		90 42.8	9.5	1 44.1	15.1	60.5
18	93 34.4	S 8 44.1		105 11.3	9.5	N 1 29.0	15.0	60.5
19	108 34.6	45.0		119 39.8	9.5	1 14.0	15.1	60.5
20	123 34.7	46.0		134 08.3	9.6	0 58.9	15.1	60.5
21	138 34.8	. . 46.9		148 36.9	9.6	0 43.8	15.0	60.5
22	153 35.0	47.8		163 05.5	9.6	0 28.8	15.1	60.5
23	168 35.1	48.7		177 34.1	9.6	N 0 13.7	15.1	60.5
	SD 16.1	d 0.9		SD 16.4		16.5		16.5

Lat.	Crepúsculo Náutico	Crepúsculo Civil	Orto Sol	Orto Luna 13	Orto Luna 14	Orto Luna 15	Orto Luna 16
°	h m	h m	h m	h m	h m	h m	h m
N 72	04 51	06 09	07 19	25 02	01 02	03 27	05 44
N 70	04 55	06 06	07 09	25 22	01 22	03 34	05 42
68	04 59	06 03	07 00	25 37	01 37	03 40	05 40
66	05 01	06 01	06 53	25 50	01 50	03 45	05 38
64	05 03	05 58	06 47	00 09	02 00	03 49	05 37
62	05 05	05 56	06 41	00 24	02 09	03 53	05 36
60	05 07	05 55	06 37	00 37	02 17	03 56	05 35
N 58	05 08	05 53	06 33	00 48	02 23	03 59	05 34
56	05 09	05 52	06 29	00 57	02 29	04 01	05 33
54	05 09	05 50	06 26	01 05	02 34	04 04	05 32
52	05 10	05 49	06 23	01 12	02 39	04 06	05 32
50	05 10	05 48	06 20	01 19	02 43	04 07	05 31
45	05 11	05 45	06 14	01 33	02 52	04 11	05 30
N 40	05 11	05 42	06 09	01 45	03 00	04 15	05 29
35	05 10	05 40	06 05	01 55	03 06	04 17	05 28
30	05 09	05 37	06 01	02 03	03 12	04 20	05 27
20	05 07	05 32	05 54	02 18	03 22	04 24	05 26
N 10	05 03	05 27	05 48	02 31	03 30	04 28	05 25
0	04 58	05 22	05 43	02 43	03 38	04 32	05 24
S 10	04 51	05 16	05 37	02 55	03 46	04 35	05 23
20	04 42	05 08	05 30	03 08	03 55	04 39	05 22
30	04 30	04 59	05 23	03 22	04 04	04 43	05 21
35	04 22	04 53	05 19	03 31	04 10	04 46	05 20
40	04 13	04 46	05 14	03 40	04 16	04 48	05 19
45	04 02	04 38	05 08	03 52	04 23	04 52	05 18
S 50	03 47	04 28	05 01	04 05	04 32	04 55	05 17
52	03 40	04 23	04 58	04 11	04 36	04 57	05 17
54	03 31	04 18	04 55	04 18	04 40	04 59	05 17
56	03 22	04 11	04 51	04 26	04 45	05 01	05 16
58	03 11	04 05	04 46	04 34	04 50	05 04	05 15
S 60	02 59	03 57	04 42	04 44	04 56	05 06	05 15

Lat.	Ocaso Sol	Crepúsculo Civil	Crepúsculo Náutico	Ocaso Luna 13	Ocaso Luna 14	Ocaso Luna 15	Ocaso Luna 16
°	h m	h m	h m	h m	h m	h m	h m
N 72	16 11	17 21	18 38	18 12	17 41	17 16	16 52
N 70	16 22	17 24	18 34	17 50	17 31	17 14	16 58
68	16 30	17 27	18 31	17 33	17 22	17 13	17 03
66	16 38	17 30	18 29	17 18	17 15	17 11	17 07
64	16 44	17 32	18 27	17 07	17 09	17 10	17 11
62	16 49	17 34	18 25	16 57	17 03	17 09	17 14
60	16 54	17 36	18 24	16 48	16 59	17 08	17 17
N 58	16 58	17 38	18 23	16 40	16 55	17 07	17 19
56	17 02	17 39	18 22	16 33	16 51	17 06	17 21
54	17 05	17 41	18 22	16 27	16 48	17 06	17 23
52	17 08	17 42	18 21	16 22	16 45	17 05	17 25
50	17 11	17 43	18 21	16 17	16 42	17 04	17 26
45	17 17	17 46	18 20	16 06	16 36	17 03	17 30
N 40	17 22	17 49	18 21	15 57	16 31	17 02	17 33
35	17 26	17 52	18 21	15 49	16 26	17 01	17 35
30	17 30	17 54	18 22	15 42	16 22	17 00	17 38
20	17 37	17 59	18 25	15 30	16 15	16 59	17 42
N 10	17 43	18 05	18 29	15 19	16 09	16 58	17 45
0	17 49	18 10	18 34	15 09	16 04	16 56	17 48
S 10	17 55	18 17	18 41	14 59	15 58	16 55	17 52
20	18 02	18 24	18 50	14 48	15 52	16 54	17 55
30	18 09	18 34	19 02	14 36	15 44	16 52	17 59
35	18 14	18 40	19 10	14 29	15 40	16 51	18 01
40	18 19	18 47	19 20	14 20	15 35	16 50	18 04
45	18 25	18 55	19 32	14 10	15 30	16 49	18 07
S 50	18 32	19 05	19 47	13 59	15 23	16 47	18 10
52	18 35	19 10	19 54	13 53	15 20	16 46	18 12
54	18 39	19 16	20 02	13 47	15 16	16 46	18 14
56	18 43	19 22	20 12	13 40	15 13	16 45	18 16
58	18 47	19 29	20 23	13 32	15 08	16 44	18 18
S 60	18 52	19 37	20 36	13 23	15 04	16 43	18 21

Día	SOL E.T. (+) 00h	SOL E.T. (+) 12h	SOL Pas. Mer.	LUNA Pas. Sup.	LUNA Mer. Inf.	LUNA Edad	LUNA Fase
d	m s	m s	h m	h m	h m	d	%
13	13 40	13 47	11 46	08 56	21 24	26	15
14	13 54	14 01	11 46	09 51	22 18	27	8
15	14 08	14 14	11 46	10 44	23 10	28	3

T.U.	ARIES	VENUS −3.9		MARTE −0.1		JUPITER −2.3		SATURNO −0.2	
d h	A.H.G.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.
	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
16 00	24 34.6	203 23.5	N 1 08.2	90 13.9	S24 05.6	278 07.1	N22 25.4	311 00.8	N20 42.5
01	39 37.1	218 23.1	07.0	105 14.6	05.2	293 09.4	25.4	326 03.4	42.5
02	54 39.5	233 22.7	05.7	120 15.3	04.9	308 11.7	25.4	341 06.0	42.5
03	69 42.0	248 22.3 . .	04.5	135 16.0 . .	04.6	323 14.0 . .	25.4	356 08.5 . .	42.5
04	84 44.4	263 21.9	03.3	150 16.7	04.2	338 16.3	25.4	11 11.1	42.4
05	99 46.9	278 21.5	02.1	165 17.4	03.9	353 18.6	25.3	26 13.6	42.4
06	114 49.4	293 21.1	N 1 00.9	180 18.1	S24 03.6	8 20.9	N22 25.3	41 16.2	N20 42.4
07	129 51.8	308 20.8	0 59.7	195 18.8	03.2	23 23.2	25.3	56 18.7	42.4
M 08	144 54.3	323 20.4	58.5	210 19.5	02.9	38 25.5	25.3	71 21.3	42.4
09	159 56.8	338 20.0 . .	57.3	225 20.2 . .	02.5	53 27.9 . .	25.3	86 23.8 . .	42.4
A 10	174 59.2	353 19.6	56.1	240 20.9	02.2	68 30.2	25.3	101 26.4	42.4
R 11	190 01.7	8 19.2	54.8	255 21.6	01.9	83 32.5	25.3	116 29.0	42.3
T 12	205 04.2	23 18.8	N 0 53.6	270 22.3	S24 01.5	98 34.8	N22 25.3	131 31.5	N20 42.3
13	220 06.6	38 18.4	52.4	285 23.0	01.2	113 37.1	25.2	146 34.1	42.3
E 14	235 09.1	53 18.0	51.2	300 23.7	00.9	128 39.4	25.2	161 36.6	42.3
15	250 11.6	68 17.6 . .	50.0	315 24.4 . .	00.5	143 41.8 . .	25.2	176 39.2 . .	42.3
S 16	265 14.0	83 17.3	48.8	330 25.1	24 00.2	158 44.1	25.2	191 41.7	42.3
17	280 16.5	98 16.9	47.6	345 25.8	23 59.9	173 46.4	25.2	206 44.3	42.3
18	295 18.9	113 16.5	N 0 46.4	0 26.5	S23 59.5	188 48.7	N22 25.2	221 46.8	N20 42.2
19	310 21.4	128 16.1	45.1	15 27.2	59.2	203 51.0	25.2	236 49.4	42.2
20	325 23.9	143 15.7	43.9	30 27.9	58.8	218 53.3	25.2	251 52.0	42.2
21	340 26.3	158 15.3 . .	42.7	45 28.6 . .	58.5	233 55.7 . .	25.2	266 54.5 . .	42.2
22	355 28.8	173 14.9	41.5	60 29.3	58.2	248 58.0	25.1	281 57.1	42.2
23	10 31.3	188 14.5	40.3	75 30.0	57.8	264 00.3	25.1	296 59.6	42.2
17 00	25 33.7	203 14.1	N 0 39.1	90 30.7	S23 57.5	279 02.6	N22 25.1	312 02.2	N20 42.2
01	40 36.2	218 13.7	37.9	105 31.4	57.1	294 04.9	25.1	327 04.8	42.1
02	55 38.7	233 13.4	36.7	120 32.1	56.8	309 07.2	25.1	342 07.3	42.1
03	70 41.1	248 13.0 . .	35.4	135 32.8 . .	56.5	324 09.6 . .	25.1	357 09.9 . .	42.1
04	85 43.6	263 12.6	34.2	150 33.4	56.1	339 11.9	25.1	12 12.4	42.1
05	100 46.0	278 12.2	33.0	165 34.1	55.8	354 14.2	25.1	27 15.0	42.1
06	115 48.5	293 11.8	N 0 31.8	180 34.8	S23 55.4	9 16.5	N22 25.0	42 17.5	N20 42.1
M 07	130 51.0	308 11.4	30.6	195 35.5	55.1	24 18.8	25.0	57 20.1	42.1
I 08	145 53.4	323 11.0	29.4	210 36.2	54.7	39 21.2	25.0	72 22.7	42.1
09	160 55.9	338 10.6 . .	28.2	225 36.9 . .	54.4	54 23.5 . .	25.0	87 25.2 . .	42.0
E 10	175 58.4	353 10.2	26.9	240 37.6	54.0	69 25.8	25.0	102 27.8	42.0
R 11	191 00.8	8 09.9	25.7	255 38.3	53.7	84 28.1	25.0	117 30.3	42.0
C 12	206 03.3	23 09.5	N 0 24.5	270 39.0	S23 53.4	99 30.5	N22 25.0	132 32.9	N20 42.0
O 13	221 05.8	38 09.1	23.3	285 39.7	53.0	114 32.8	25.0	147 35.5	42.0
L 14	236 08.2	53 08.7	22.1	300 40.4	52.7	129 35.1	25.0	162 38.0	42.0
E 15	251 10.7	68 08.3 . .	20.9	315 41.1 . .	52.3	144 37.4 . .	24.9	177 40.6 . .	42.0
S 16	266 13.2	83 07.9	19.7	330 41.8	52.0	159 39.8	24.9	192 43.2	41.9
17	281 15.6	98 07.5	18.4	345 42.5	51.6	174 42.1	24.9	207 45.7	41.9
18	296 18.1	113 07.1	N 0 17.2	0 43.2	S23 51.3	189 44.4	N22 24.9	222 48.3	N20 41.9
19	311 20.5	128 06.7	16.0	15 43.9	50.9	204 46.7	24.9	237 50.8	41.9
20	326 23.0	143 06.3	14.8	30 44.6	50.6	219 49.1	24.9	252 53.4	41.9
21	341 25.5	158 06.0 . .	13.6	45 45.3 . .	50.2	234 51.4 . .	24.9	267 56.0 . .	41.9
22	356 27.9	173 05.6	12.4	60 46.0	49.9	249 53.7	24.9	282 58.5	41.9
23	11 30.4	188 05.2	11.2	75 46.7	49.5	264 56.0	24.9	298 01.1	41.8
18 00	26 32.9	203 04.8	N 0 09.9	90 47.3	S23 49.2	279 58.4	N22 24.9	313 03.7	N20 41.8
01	41 35.3	218 04.4	08.7	105 48.0	48.8	295 00.7	24.8	328 06.2	41.8
02	56 37.8	233 04.0	07.5	120 48.7	48.5	310 03.0	24.8	343 08.8	41.8
03	71 40.3	248 03.6 . .	06.3	135 49.4 . .	48.1	325 05.3 . .	24.8	358 11.3 . .	41.8
04	86 42.7	263 03.2	05.1	150 50.1	47.8	340 07.7	24.8	13 13.9	41.8
05	101 45.2	278 02.8	03.9	165 50.8	47.4	355 10.0	24.8	28 16.5	41.7
06	116 47.6	293 02.4	N 0 02.6	180 51.5	S23 47.1	10 12.3	N22 24.8	43 19.0	N20 41.7
07	131 50.1	308 02.1	01.4	195 52.2	46.7	25 14.7	24.8	58 21.6	41.7
J 08	146 52.6	323 01.7	N 00.2	210 52.9	46.4	40 17.0	24.8	73 24.2	41.7
U 09	161 55.0	338 01.3	S 01.0	225 53.6 . .	46.0	55 19.3 . .	24.8	88 26.7 . .	41.7
E 10	176 57.5	353 00.9	02.2	240 54.3	45.7	70 21.7	24.7	103 29.3	41.7
V 11	192 00.0	8 00.5	03.4	255 55.0	45.3	85 24.0	24.7	118 31.9	41.7
E 12	207 02.4	23 00.1	S 0 04.7	270 55.7	S23 45.0	100 26.3	N22 24.7	133 34.4	N20 41.6
S 13	222 04.9	37 59.7	05.9	285 56.4	44.6	115 28.6	24.7	148 37.0	41.6
14	237 07.4	52 59.3	07.1	300 57.0	44.3	130 31.0	24.7	163 39.5	41.6
15	252 09.8	67 58.9 . .	08.3	315 57.7 . .	43.9	145 33.3 . .	24.7	178 42.1 . .	41.6
16	267 12.3	82 58.5	09.5	330 58.4	43.6	160 35.6	24.7	193 44.7	41.6
17	282 14.8	97 58.1	10.7	345 59.1	43.2	175 38.0	24.7	208 47.2	41.6
18	297 17.2	112 57.8	S 0 12.0	0 59.8	S23 42.9	190 40.3	N22 24.7	223 49.8	N20 41.6
19	312 19.7	127 57.4	13.2	16 00.5	42.5	205 42.6	24.7	238 52.4	41.5
20	327 22.1	142 57.0	14.4	31 01.2	42.1	220 45.0	24.6	253 54.9	41.5
21	342 24.6	157 56.6 . .	15.6	46 01.9 . .	41.8	235 47.3 . .	24.6	268 57.5 . .	41.5
22	357 27.1	172 56.2	16.8	61 02.6	41.4	250 49.7	24.6	284 00.1	41.5
23	12 29.5	187 55.8	18.0	76 03.3	41.1	265 52.0	24.6	299 02.6	41.5
Pas. Mer.	h m 22 14.1	v −0.4	d 1.2	v 0.7	d 0.3	v 2.3	d 0.0	v 2.6	d 0.0

ESTRELLAS		
Nombre	A.H.S.	Dec.
	° ′	° ′
Acamar	315 24.9	S40 17.8
Achernar	335 32.9	S57 13.7
Acrux	173 20.5	S63 06.3
Adhara	255 19.7	S28 58.2
Aldebaran	290 59.7	N16 30.8
Alioth	166 29.2	N55 57.1
Alkaid	153 06.5	N49 18.5
Al Na'ir	27 54.9	S46 57.4
Alnilam	275 55.5	S 1 11.9
Alphard	218 05.3	S 8 39.7
Alphecca	126 19.1	N26 42.8
Alpheratz	357 52.7	N29 06.1
Altair	62 17.2	N 8 52.5
Ankaa	353 24.3	S42 17.9
Antares	112 37.9	S26 26.1
Arcturus	146 04.4	N19 10.6
Atria	107 48.4	S69 02.0
Avior	234 22.0	S59 30.5
Bellatrix	278 41.7	N 6 21.2
Betelgeuse	271 11.1	N 7 24.5
Canopus	264 00.1	S52 41.5
Capella	280 47.8	N45 59.9
Deneb	49 37.7	N45 17.4
Denebola	182 43.3	N14 33.9
Diphda	349 04.8	S17 58.6
Dubhe	194 03.3	N61 44.5
Elnath	278 24.1	N28 36.5
Eltanin	90 50.7	N51 29.6
Enif	33 56.0	N 9 53.1
Fomalhaut	15 33.8	S29 36.9
Gacrux	172 11.9	S57 07.1
Gienah	176 02.1	S17 32.8
Hadar	149 01.8	S60 22.8
Hamal	328 10.8	N23 28.3
Kaus Aust.	83 56.1	S34 23.1
Kochab	137 20.6	N74 09.1
Markab	13 47.3	N15 12.9
Menkar	314 24.4	N 4 05.8
Menkent	148 18.9	S36 22.5
Miaplacidus	221 42.1	S69 43.1
Mirfak	308 53.2	N49 52.0
Nunki	76 09.8	S26 17.7
Peacock	53 33.5	S56 44.0
Pollux	243 39.0	N28 01.3
Procyon	245 09.3	N 5 13.4
Rasalhague	96 15.2	N12 33.7
Regulus	207 53.5	N11 57.7
Rigel	281 20.7	S 8 11.8
Rigil Kent.	140 05.2	S60 50.4
Sabik	102 23.3	S15 43.5
Schedar	349 50.6	N56 32.9
Shaula	96 34.6	S37 06.4
Sirius	258 41.8	S16 42.9
Spica	158 41.3	S11 10.0
Suhail	222 59.4	S43 26.0
Vega	80 45.3	N38 47.4
Zuben'ubi	137 16.0	S16 02.8

	A.H.S.	Pas. Mer.
	° ′	h m
Venus	177 40.4	10 27
Marte	64 56.9	17 57
Júpiter	253 28.9	5 23
Saturno	286 28.5	3 11

T.U.	SOL				LUNA					
	A.H.G.		Dec.		A.H.G.	v	Dec.		d	P.H.
d h	° ′		° ′		° ′	′	° ′		′	′
16 00	183 35.2	S	8 49.6		192 02.7	9.6	S 0 01.4		15.0	60.5
01	198 35.4		50.6		206 31.3	9.6	0 16.4		15.1	60.4
02	213 35.5		51.5		220 59.9	9.6	0 31.5		15.0	60.4
03	228 35.7	. .	52.4		235 28.5	9.7	0 46.5		15.1	60.4
04	243 35.8		53.3		249 57.2	9.6	1 01.6		15.0	60.4
05	258 35.9		54.2		264 25.8	9.7	1 16.6		15.0	60.4
06	273 36.0	S	8 55.2		278 54.5	9.7	S 1 31.6		15.0	60.4
07	288 36.2		56.1		293 23.2	9.6	1 46.6		15.0	60.4
M 08	303 36.3		57.0		307 51.8	9.7	2 01.6		14.9	60.3
A 09	318 36.4	. .	57.9		322 20.5	9.7	2 16.5		15.0	60.3
10	333 36.6		58.8		336 49.2	9.7	2 31.5		14.9	60.3
R 11	348 36.7		8 59.8		351 17.9	9.7	2 46.4		14.9	60.3
T 12	3 36.8	S	9 00.7		5 46.6	9.7	S 3 01.3		14.8	60.3
13	18 37.0		01.6		20 15.3	9.7	3 16.1		14.9	60.3
E 14	33 37.1		02.5		34 44.0	9.7	3 31.0		14.8	60.2
S 15	48 37.2	. .	03.4		49 12.7	9.7	3 45.8		14.8	60.2
16	63 37.4		04.4		63 41.4	9.7	4 00.6		14.7	60.2
17	78 37.5		05.3		78 10.1	9.7	4 15.3		14.7	60.2
18	93 37.6	S	9 06.2		92 38.8	9.7	S 4 30.0		14.7	60.2
19	108 37.7		07.1		107 07.5	9.7	4 44.7		14.7	60.2
20	123 37.9		08.0		121 36.2	9.7	4 59.4		14.6	60.1
21	138 38.0	. .	08.9		136 04.9	9.7	5 14.0		14.5	60.1
22	153 38.1		09.9		150 33.6	9.7	5 28.5		14.6	60.1
23	168 38.3		10.8		165 02.3	9.6	5 43.1		14.4	60.1
17 00	183 38.4	S	9 11.7		179 30.9	9.7	S 5 57.5		14.5	60.1
01	198 38.5		12.6		193 59.6	9.7	6 12.0		14.4	60.0
02	213 38.6		13.5		208 28.3	9.7	6 26.4		14.3	60.0
03	228 38.8	. .	14.4		222 57.0	9.6	6 40.7		14.3	60.0
04	243 38.9		15.3		237 25.6	9.7	6 55.0		14.3	60.0
05	258 39.0		16.3		251 54.3	9.6	7 09.3		14.2	59.9
06	273 39.1	S	9 17.2		266 22.9	9.7	S 7 23.5		14.1	59.9
M 07	288 39.3		18.1		280 51.6	9.6	7 37.6		14.1	59.9
I 08	303 39.4		19.0		295 20.2	9.6	7 51.7		14.0	59.9
E 09	318 39.5	. .	19.9		309 48.8	9.6	8 05.7		14.0	59.8
R 10	333 39.7		20.8		324 17.4	9.6	8 19.7		13.9	59.8
C 11	348 39.8		21.7		338 46.0	9.6	8 33.6		13.8	59.8
O 12	3 39.9	S	9 22.7		353 14.6	9.6	S 8 47.4		13.8	59.8
L 13	18 40.0		23.6		7 43.2	9.6	9 01.2		13.7	59.7
14	33 40.1		24.5		22 11.8	9.5	9 14.9		13.7	59.7
E 15	48 40.3	. .	25.4		36 40.3	9.6	9 28.6		13.6	59.7
S 16	63 40.4		26.3		51 08.9	9.5	9 42.2		13.5	59.7
17	78 40.5		27.2		65 37.4	9.5	9 55.7		13.5	59.6
18	93 40.6	S	9 28.1		80 05.9	9.5	S10 09.2		13.4	59.6
19	108 40.8		29.0		94 34.4	9.5	10 22.6		13.3	59.6
20	123 40.9		30.0		109 02.9	9.5	10 35.9		13.2	59.5
21	138 41.0	. .	30.9		123 31.4	9.4	10 49.1		13.2	59.5
22	153 41.1		31.8		137 59.8	9.5	11 02.3		13.1	59.5
23	168 41.3		32.7		152 28.3	9.4	11 15.4		13.0	59.5
18 00	183 41.4	S	9 33.6		166 56.7	9.4	S11 28.4		12.9	59.4
01	198 41.5		34.5		181 25.1	9.4	11 41.3		12.8	59.4
02	213 41.6		35.4		195 53.5	9.4	11 54.1		12.8	59.4
03	228 41.7	. .	36.3		210 21.9	9.3	12 06.9		12.7	59.3
04	243 41.9		37.2		224 50.2	9.4	12 19.6		12.6	59.3
05	258 42.0		38.1		239 18.6	9.3	12 32.2		12.5	59.3
06	273 42.1	S	9 39.1		253 46.9	9.3	S12 44.7		12.4	59.2
07	288 42.2		40.0		268 15.2	9.3	12 57.1		12.4	59.2
J 08	303 42.3		40.9		282 43.5	9.2	13 09.5		12.2	59.2
U 09	318 42.5	. .	41.8		297 11.7	9.3	13 21.7		12.2	59.1
10	333 42.6		42.7		311 40.0	9.2	13 33.9		12.1	59.1
E 11	348 42.7		43.6		326 08.2	9.2	13 46.0		11.9	59.1
V 12	3 42.8	S	9 44.5		340 36.4	9.2	S13 57.9		11.9	59.0
13	18 42.9		45.4		355 04.6	9.2	14 09.8		11.8	59.0
E 14	33 43.1		46.3		9 32.8	9.2	14 21.6		11.7	59.0
S 15	48 43.2	. .	47.2		24 01.0	9.1	14 33.3		11.6	58.9
16	63 43.3		48.1		38 29.1	9.1	14 44.9		11.5	58.9
17	78 43.4		49.0		52 57.2	9.1	14 56.4		11.4	58.9
18	93 43.5	S	9 49.9		67 25.3	9.1	S15 07.8		11.3	58.8
19	108 43.6		50.8		81 53.4	9.0	15 19.1		11.2	58.8
20	123 43.8		51.7		96 21.4	9.1	15 30.3		11.1	58.8
21	138 43.9	. .	52.7		110 49.5	9.0	15 41.4		11.0	58.7
22	153 44.0		53.6		125 17.5	9.0	15 52.4		10.9	58.7
23	168 44.1		54.5		139 45.5	9.0	S16 03.3		10.8	58.7
	SD 16.1		d 0.9		SD 16.4		16.3			16.1

Lat.	Crepúsculo Náutico	Crepúsculo Civil	Orto Sol	Orto Luna 16	Orto Luna 17	Orto Luna 18	Orto Luna 19
°	h m	h m	h m	h m	h m	h m	h m
N 72	05 04	06 22	07 34	05 44	08 02	10 31	▬
N 70	05 07	06 18	07 21	05 42	07 49	10 02	12 37
68	05 09	06 13	07 11	05 40	07 39	09 41	11 49
66	05 11	06 10	07 03	05 38	07 30	09 24	11 19
64	05 12	06 07	06 56	05 37	07 23	09 10	10 56
62	05 13	06 04	06 50	05 36	07 17	08 59	10 39
60	05 14	06 02	06 44	05 35	07 12	08 49	10 24
N 58	05 14	06 00	06 40	05 34	07 08	08 41	10 11
56	05 14	05 58	06 35	05 33	07 04	08 33	10 00
54	05 15	05 56	06 32	05 32	07 00	08 27	09 51
52	05 15	05 54	06 28	05 32	06 57	08 21	09 43
50	05 15	05 52	06 25	05 31	06 54	08 16	09 35
45	05 14	05 49	06 18	05 30	06 48	08 04	09 19
N 40	05 14	05 45	06 13	05 29	06 42	07 55	09 06
35	05 13	05 42	06 08	05 28	06 38	07 47	08 55
30	05 11	05 39	06 03	05 27	06 34	07 40	08 45
20	05 07	05 33	05 55	05 26	06 27	07 28	08 29
N 10	05 03	05 27	05 49	05 25	06 21	07 18	08 14
0	04 57	05 21	05 42	05 24	06 16	07 08	08 01
S 10	04 49	05 14	05 35	05 23	06 10	06 58	07 48
20	04 40	05 06	05 28	05 22	06 04	06 48	07 33
30	04 27	04 55	05 20	05 21	05 58	06 37	07 17
35	04 18	04 49	05 15	05 20	05 54	06 30	07 08
40	04 08	04 42	05 09	05 19	05 50	06 22	06 58
45	03 56	04 32	05 03	05 18	05 45	06 14	06 45
S 50	03 40	04 21	04 55	05 17	05 40	06 03	06 31
52	03 32	04 16	04 52	05 17	05 37	05 59	06 24
54	03 23	04 10	04 48	05 17	05 34	05 53	06 16
56	03 13	04 03	04 43	05 16	05 31	05 48	06 07
58	03 01	03 56	04 38	05 15	05 27	05 41	05 58
S 60	02 47	03 47	04 33	05 15	05 24	05 34	05 47

Lat.	Ocaso Sol	Crepúsculo Civil	Crepúsculo Náutico	Ocaso Luna 16	Ocaso Luna 17	Ocaso Luna 18	Ocaso Luna 19
°	h m	h m	h m	h m	h m	h m	h m
N 72	15 55	17 06	18 24	16 52	16 25	15 47	▬
N 70	16 08	17 11	18 22	16 58	16 41	16 18	15 35
68	16 18	17 16	18 20	17 03	16 53	16 41	16 23
66	16 26	17 19	18 18	17 07	17 03	16 59	16 55
64	16 34	17 22	18 17	17 11	17 12	17 14	17 18
62	16 40	17 25	18 16	17 14	17 19	17 26	17 37
60	16 45	17 28	18 16	17 17	17 26	17 37	17 52
N 58	16 50	17 30	18 15	17 19	17 31	17 46	18 05
56	16 54	17 32	18 15	17 21	17 37	17 55	18 17
54	16 58	17 34	18 15	17 23	17 41	18 02	18 27
52	17 02	17 36	18 15	17 25	17 45	18 08	18 36
50	17 05	17 38	18 15	17 26	17 49	18 14	18 44
45	17 12	17 41	18 15	17 30	17 57	18 27	19 01
N 40	17 18	17 45	18 16	17 33	18 04	18 38	19 15
35	17 23	17 48	18 18	17 35	18 10	18 47	19 27
30	17 27	17 51	18 19	17 38	18 16	18 55	19 38
20	17 35	17 57	18 23	17 42	18 25	19 09	19 56
N 10	17 42	18 03	18 28	17 45	18 33	19 21	20 12
0	17 49	18 10	18 34	17 48	18 40	19 33	20 26
S 10	17 55	18 17	18 42	17 52	18 48	19 45	20 41
20	18 03	18 25	18 52	17 55	18 56	19 57	20 57
30	18 11	18 36	19 05	17 59	19 05	20 11	21 16
35	18 16	18 42	19 13	18 01	19 11	20 19	21 26
40	18 22	18 50	19 23	18 04	19 17	20 29	21 39
45	18 29	18 59	19 36	18 07	19 24	20 40	21 53
S 50	18 37	19 11	19 53	18 10	19 33	20 54	22 11
52	18 40	19 16	20 01	18 12	19 37	21 00	22 20
54	18 44	19 22	20 10	18 14	19 41	21 07	22 29
56	18 49	19 29	20 20	18 16	19 46	21 15	22 40
58	18 54	19 37	20 32	18 18	19 52	21 24	22 52
S 60	19 00	19 46	20 47	18 21	19 58	21 34	23 06

Día	SOL E.T. (+) 00h	SOL E.T. (+) 12h	SOL Pas. Mer.	LUNA Pas. Sup.	LUNA Mer. Inf.	LUNA Edad	LUNA Fase
d	m s	m s	h m	h m	h m	d	%
16	14 21	14 27	11 46	11 36	24 02	29	0
17	14 33	14 39	11 45	12 28	00 02	01	1
18	14 45	14 51	11 45	13 20	00 54	02	4

T.U.	ARIES	VENUS −3.9		MARTE −0.1		JUPITER −2.4		SATURNO −0.2	
d h	A.H.G.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.
	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
19 00	27 32.0	202 55.4	S 0 19.3	91 04.0	S23 40.7	280 54.3	N22 24.6	314 05.2	N20 41.5
01	42 34.5	217 55.0	20.5	106 04.6	40.4	295 56.7	24.6	329 07.8	41.5
02	57 36.9	232 54.6	21.7	121 05.3	40.0	310 59.0	24.6	344 10.3	41.4
03	72 39.4	247 54.2	. . 22.9	136 06.0	. . 39.6	326 01.3	. . 24.6	359 12.9	. . 41.4
04	87 41.9	262 53.8	24.1	151 06.7	39.3	341 03.7	24.6	14 15.5	41.4
05	102 44.3	277 53.5	25.3	166 07.4	38.9	356 06.0	24.6	29 18.1	41.4
06	117 46.8	292 53.1	S 0 26.6	181 08.1	S23 38.6	11 08.3	N22 24.6	44 20.6	N20 41.4
07	132 49.3	307 52.7	27.8	196 08.8	38.2	26 10.7	24.5	59 23.2	41.4
V 08	147 51.7	322 52.3	29.0	211 09.5	37.8	41 13.0	24.5	74 25.8	41.4
I 09	162 54.2	337 51.9	. . 30.2	226 10.2	. . 37.5	56 15.4	. . 24.5	89 28.3	. . 41.3
E 10	177 56.6	352 51.5	31.4	241 10.9	37.1	71 17.7	24.5	104 30.9	41.3
R 11	192 59.1	7 51.1	32.6	256 11.5	36.8	86 20.0	24.5	119 33.5	41.3
N 12	208 01.6	22 50.7	S 0 33.9	271 12.2	S23 36.4	101 22.4	N22 24.5	134 36.0	N20 41.3
E 13	223 04.0	37 50.3	35.1	286 12.9	36.0	116 24.7	24.5	149 38.6	41.3
S 14	238 06.5	52 49.9	36.3	301 13.6	35.7	131 27.1	24.5	164 41.2	41.3
15	253 09.0	67 49.5	. . 37.5	316 14.3	. . 35.3	146 29.4	. . 24.5	179 43.7	. . 41.2
16	268 11.4	82 49.1	38.7	331 15.0	34.9	161 31.7	24.5	194 46.3	41.2
17	283 13.9	97 48.8	39.9	346 15.7	34.6	176 34.1	24.4	209 48.9	41.2
18	298 16.4	112 48.4	S 0 41.2	1 16.4	S23 34.2	191 36.4	N22 24.4	224 51.5	N20 41.2
19	313 18.8	127 48.0	42.4	16 17.1	33.9	206 38.8	24.4	239 54.0	41.2
20	328 21.3	142 47.6	43.6	31 17.7	33.5	221 41.1	24.4	254 56.6	41.2
21	343 23.7	157 47.2	. . 44.8	46 18.4	. . 33.1	236 43.5	. . 24.4	269 59.2	. . 41.2
22	358 26.2	172 46.8	46.0	61 19.1	32.8	251 45.8	24.4	285 01.7	41.1
23	13 28.7	187 46.4	47.3	76 19.8	32.4	266 48.1	24.4	300 04.3	41.1
20 00	28 31.1	202 46.0	S 0 48.5	91 20.5	S23 32.0	281 50.5	N22 24.4	315 06.9	N20 41.1
01	43 33.6	217 45.6	49.7	106 21.2	31.7	296 52.8	24.4	330 09.5	41.1
02	58 36.1	232 45.2	50.9	121 21.9	31.3	311 55.2	24.4	345 12.0	41.1
03	73 38.5	247 44.8	. . 52.1	136 22.6	. . 30.9	326 57.5	. . 24.4	0 14.6	. . 41.1
04	88 41.0	262 44.4	53.3	151 23.2	30.6	341 59.9	24.4	15 17.2	41.0
05	103 43.5	277 44.0	54.6	166 23.9	30.2	357 02.2	24.3	30 19.7	41.0
06	118 45.9	292 43.7	S 0 55.8	181 24.6	S23 29.8	12 04.6	N22 24.3	45 22.3	N20 41.0
07	133 48.4	307 43.3	57.0	196 25.3	29.5	27 06.9	24.3	60 24.9	41.0
S 08	148 50.9	322 42.9	58.2	211 26.0	29.1	42 09.2	24.3	75 27.5	41.0
A 09	163 53.3	337 42.5	0 59.4	226 26.7	. . 28.7	57 11.6	. . 24.3	90 30.0	. . 41.0
B 10	178 55.8	352 42.1	1 00.7	241 27.4	28.4	72 13.9	24.3	105 32.6	41.0
A 11	193 58.2	7 41.7	01.9	256 28.1	28.0	87 16.3	24.3	120 35.2	40.9
D 12	209 00.7	22 41.3	S 1 03.1	271 28.7	S23 27.6	102 18.6	N22 24.3	135 37.8	N20 40.9
O 13	224 03.2	37 40.9	04.3	286 29.4	27.2	117 21.0	24.3	150 40.3	40.9
14	239 05.6	52 40.5	05.5	301 30.1	26.9	132 23.3	24.3	165 42.9	40.9
15	254 08.1	67 40.1	. . 06.8	316 30.8	. . 26.5	147 25.7	. . 24.3	180 45.5	. . 40.9
16	269 10.6	82 39.7	08.0	331 31.5	26.1	162 28.0	24.2	195 48.1	40.9
17	284 13.0	97 39.3	09.2	346 32.2	25.8	177 30.4	24.2	210 50.6	40.8
18	299 15.5	112 38.9	S 1 10.4	1 32.9	S23 25.4	192 32.7	N22 24.2	225 53.2	N20 40.8
19	314 18.0	127 38.5	11.6	16 33.5	25.0	207 35.1	24.2	240 55.8	40.8
20	329 20.4	142 38.2	12.8	31 34.2	24.6	222 37.4	24.2	255 58.4	40.8
21	344 22.9	157 37.8	. . 14.1	46 34.9	. . 24.3	237 39.8	. . 24.2	271 00.9	. . 40.8
22	359 25.4	172 37.4	15.3	61 35.6	23.9	252 42.1	24.2	286 03.5	40.8
23	14 27.8	187 37.0	16.5	76 36.3	23.5	267 44.5	24.2	301 06.1	40.8
21 00	29 30.3	202 36.6	S 1 17.7	91 37.0	S23 23.2	282 46.8	N22 24.2	316 08.7	N20 40.7
01	44 32.7	217 36.2	18.9	106 37.7	22.8	297 49.2	24.2	331 11.2	40.7
02	59 35.2	232 35.8	20.2	121 38.3	22.4	312 51.6	24.2	346 13.8	40.7
03	74 37.7	247 35.4	. . 21.4	136 39.0	. . 22.0	327 53.9	. . 24.2	1 16.4	. . 40.7
04	89 40.1	262 35.0	22.6	151 39.7	21.7	342 56.3	24.2	16 19.0	40.7
05	104 42.6	277 34.6	23.8	166 40.4	21.3	357 58.6	24.1	31 21.5	40.7
06	119 45.1	292 34.2	S 1 25.0	181 41.1	S23 20.9	13 01.0	N22 24.1	46 24.1	N20 40.6
07	134 47.5	307 33.8	26.3	196 41.8	20.5	28 03.3	24.1	61 26.7	40.6
D 08	149 50.0	322 33.4	27.5	211 42.5	20.1	43 05.7	24.1	76 29.3	40.6
O 09	164 52.5	337 33.0	. . 28.7	226 43.1	. . 19.8	58 08.0	. . 24.1	91 31.8	. . 40.6
M 10	179 54.9	352 32.6	29.9	241 43.8	19.4	73 10.4	24.1	106 34.4	40.6
I 11	194 57.4	7 32.2	31.1	256 44.5	19.0	88 12.7	24.1	121 37.0	40.6
N 12	209 59.9	22 31.8	S 1 32.3	271 45.2	S23 18.6	103 15.1	N22 24.1	136 39.6	N20 40.6
G 13	225 02.3	37 31.4	33.6	286 45.9	18.3	118 17.5	24.1	151 42.2	40.5
14	240 04.8	52 31.1	34.8	301 46.6	17.9	133 19.8	24.1	166 44.7	40.5
O 15	255 07.2	67 30.7	. . 36.0	316 47.2	. . 17.5	148 22.2	. . 24.1	181 47.3	. . 40.5
16	270 09.7	82 30.3	37.2	331 47.9	17.1	163 24.5	24.1	196 49.9	40.5
17	285 12.2	97 29.9	38.4	346 48.6	16.7	178 26.9	24.1	211 52.5	40.5
18	300 14.6	112 29.5	S 1 39.7	1 49.3	S23 16.4	193 29.3	N22 24.0	226 55.1	N20 40.5
19	315 17.1	127 29.1	40.9	16 50.0	16.0	208 31.6	24.0	241 57.6	40.4
20	330 19.6	142 28.7	42.1	31 50.7	15.6	223 34.0	24.0	257 00.2	40.4
21	345 22.0	157 28.3	. . 43.3	46 51.4	. . 15.2	238 36.3	. . 24.0	272 02.8	. . 40.4
22	0 24.5	172 27.9	44.5	61 52.0	14.8	253 38.7	24.0	287 05.4	40.4
23	15 27.0	187 27.5	45.8	76 52.7	14.5	268 41.1	24.0	302 07.9	40.4
Pas. Mer.	h m 22 02.3	v −0.4	d 1.2	v 0.7	d 0.4	v 2.3	d 0.0	v 2.6	d 0.0

ESTRELLAS

Nombre	A.H.S. ° ′	Dec. ° ′
Acamar	315 24.8	S40 17.8
Achernar	335 32.9	S57 13.7
Acrux	173 20.4	S63 06.3
Adhara	255 19.7	S28 58.2
Aldebaran	290 59.7	N16 30.8
Alioth	166 29.2	N55 57.1
Alkaid	153 06.5	N49 18.4
Al Na'ir	27 54.9	S46 57.4
Alnilam	275 55.5	S 1 11.9
Alphard	218 05.3	S 8 39.7
Alphecca	126 19.1	N26 42.8
Alpheratz	357 52.7	N29 06.1
Altair	62 17.2	N 8 52.5
Ankaa	353 24.3	S42 17.9
Antares	112 37.9	S26 26.1
Arcturus	146 04.4	N19 10.6
Atria	107 48.4	S69 02.0
Avior	234 21.9	S59 30.5
Bellatrix	278 41.7	N 6 21.1
Betelgeuse	271 11.1	N 7 24.5
Canopus	264 00.0	S52 41.5
Capella	280 47.8	N45 59.9
Deneb	49 37.7	N45 17.4
Denebola	182 43.3	N14 33.9
Diphda	349 04.8	S17 58.6
Dubhe	194 03.2	N61 44.4
Elnath	278 24.0	N28 36.5
Eltanin	90 50.7	N51 29.6
Enif	33 56.0	N 9 53.1
Fomalhaut	15 33.8	S29 36.9
Gacrux	172 11.9	S57 07.1
Gienah	176 02.1	S17 32.8
Hadar	149 01.8	S60 22.7
Hamal	328 10.8	N23 28.3
Kaus Aust	83 56.2	S34 23.1
Kochab	137 20.6	N74 09.1
Markab	13 47.3	N15 13.0
Menkar	314 24.4	N 4 05.8
Menkent	148 18.9	S36 22.5
Miaplacidus	221 42.1	S69 43.1
Mirfak	308 53.2	N49 52.0
Nunki	76 09.8	S26 17.7
Peacock	53 33.5	S56 44.0
Pollux	243 38.9	N28 01.3
Procyon	245 09.3	N 5 13.4
Rasalhague	96 15.2	N12 33.7
Regulus	207 53.5	N11 57.7
Rigel	281 20.7	S 8 11.8
Rigil Kent.	140 05.2	S60 50.4
Sabik	102 23.3	S15 43.5
Schedar	349 50.6	N56 32.9
Shaula	96 34.6	S37 06.3
Sirius	258 41.7	S16 42.9
Spica	158 41.3	S11 10.0
Suhail	222 59.4	S43 26.0
Vega	80 45.3	N38 47.4
Zuben'ub	137 16.0	S16 02.8

	A.H.S. ° ′	Pas. Mer. h m
Venus	174 14.9	10 29
Marte	62 49.4	17 54
Júpiter	253 19.3	5 12
Saturno	286 35.7	2 59

T.U.	SOL A.H.G.	SOL Dec.	LUNA A.H.G.	v	LUNA Dec.	d	P.H.
d h	° ′	° ′	° ′	′	° ′	′	′
19 00	183 44.2	S 9 55.4	154 13.5	8.9	S16 14.1	10.6	58.6
01	198 44.3	56.3	168 41.4	9.0	16 24.7	10.6	58.6
02	213 44.4	57.2	183 09.4	8.9	16 35.3	10.5	58.6
03	228 44.6	. . 58.1	197 37.3	8.9	16 45.8	10.3	58.5
04	243 44.7	59.0	212 05.2	8.9	16 56.1	10.3	58.5
05	258 44.8	9 59.9	226 33.1	8.9	17 06.4	10.1	58.5
06	273 44.9	S10 00.8	241 01.0	8.8	S17 16.5	10.0	58.4
07	288 45.0	01.7	255 28.8	8.8	17 26.5	9.9	58.4
V 08	303 45.1	02.6	269 56.6	8.9	17 36.4	9.8	58.4
I 09	318 45.2	. . 03.5	284 24.5	8.8	17 46.2	9.7	58.3
E 10	333 45.4	04.4	298 52.3	8.7	17 55.9	9.6	58.3
11	348 45.5	05.3	313 20.0	8.8	18 05.5	9.4	58.2
R 12	3 45.6	S10 06.2	327 47.8	8.7	S18 14.9	9.4	58.2
N 13	18 45.7	07.1	342 15.5	8.8	18 24.3	9.2	58.2
E 14	33 45.8	08.0	356 43.3	8.7	18 33.5	9.1	58.1
S 15	48 45.9	. . 08.9	11 11.0	8.7	18 42.6	9.0	58.1
16	63 46.0	09.8	25 38.7	8.7	18 51.6	8.8	58.1
17	78 46.1	10.7	40 06.4	8.6	19 00.4	8.8	58.0
18	93 46.2	S10 11.6	54 34.0	8.7	S19 09.2	8.6	58.0
19	108 46.4	12.5	69 01.7	8.6	19 17.8	8.5	58.0
20	123 46.5	13.4	83 29.3	8.7	19 26.3	8.4	57.9
21	138 46.6	. . 14.3	97 57.0	8.6	19 34.7	8.3	57.9
22	153 46.7	15.2	112 24.6	8.6	19 43.0	8.1	57.8
23	168 46.8	16.1	126 52.2	8.6	19 51.1	8.0	57.8
20 00	183 46.9	S10 17.0	141 19.8	8.6	S19 59.1	7.9	57.8
01	198 47.0	17.9	155 47.4	8.5	20 07.0	7.7	57.7
02	213 47.1	18.8	170 14.9	8.6	20 14.7	7.7	57.7
03	228 47.2	. . 19.7	184 42.5	8.6	20 22.4	7.5	57.7
04	243 47.3	20.6	199 10.1	8.5	20 29.9	7.4	57.6
05	258 47.4	21.5	213 37.6	8.5	20 37.3	7.2	57.6
06	273 47.5	S10 22.4	228 05.1	8.6	S20 44.5	7.2	57.5
07	288 47.7	23.3	242 32.7	8.5	20 51.7	7.0	57.5
S 08	303 47.8	24.2	257 00.2	8.5	20 58.7	6.8	57.5
A 09	318 47.9	. . 25.1	271 27.7	8.5	21 05.5	6.8	57.4
B 10	333 48.0	26.0	285 55.2	8.5	21 12.3	6.6	57.4
A 11	348 48.1	26.9	300 22.7	8.5	21 18.9	6.5	57.4
12	3 48.2	S10 27.7	314 50.2	8.5	S21 25.4	6.4	57.3
D 13	18 48.3	28.6	329 17.7	8.5	21 31.8	6.2	57.3
O 14	33 48.4	29.5	343 45.2	8.5	21 38.0	6.1	57.3
15	48 48.5	. . 30.4	358 12.7	8.4	21 44.1	6.0	57.2
16	63 48.6	31.3	12 40.1	8.5	21 50.1	5.8	57.2
17	78 48.7	32.2	27 07.6	8.5	21 55.9	5.7	57.1
18	93 48.8	S10 33.1	41 35.1	8.5	S22 01.6	5.6	57.1
19	108 48.9	34.0	56 02.6	8.5	22 07.2	5.4	57.1
20	123 49.0	34.9	70 30.1	8.5	22 12.6	5.4	57.0
21	138 49.1	. . 35.8	84 57.6	8.5	22 18.0	5.1	57.0
22	153 49.2	36.7	99 25.1	8.5	22 23.1	5.1	57.0
23	168 49.3	37.6	113 52.6	8.5	22 28.2	4.9	56.9
21 00	183 49.4	S10 38.5	128 20.1	8.5	S22 33.1	4.8	56.9
01	198 49.5	39.4	142 47.6	8.5	22 37.9	4.7	56.9
02	213 49.6	40.2	157 15.1	8.5	22 42.6	4.5	56.8
03	228 49.7	. . 41.1	171 42.6	8.6	22 47.1	4.4	56.8
04	243 49.8	42.0	186 10.2	8.5	22 51.5	4.2	56.7
05	258 49.9	42.9	200 37.7	8.5	22 55.7	4.2	56.7
06	273 50.0	S10 43.8	215 05.2	8.6	S22 59.9	3.9	56.7
D 07	288 50.1	44.7	229 32.8	8.6	23 03.8	3.9	56.6
O 08	303 50.2	45.6	244 00.4	8.6	23 07.7	3.7	56.6
M 09	318 50.3	. . 46.5	258 28.0	8.5	23 11.4	3.6	56.6
I 10	333 50.4	47.4	272 55.5	8.7	23 15.0	3.5	56.5
11	348 50.5	48.3	287 23.2	8.6	23 18.5	3.3	56.5
N 12	3 50.6	S10 49.1	301 50.8	8.6	S23 21.8	3.2	56.5
G 13	18 50.7	50.0	316 18.4	8.7	23 25.0	3.1	56.4
O 14	33 50.8	50.9	330 46.1	8.7	23 28.1	2.9	56.4
15	48 50.9	. . 51.8	345 13.8	8.7	23 31.0	2.8	56.4
16	63 51.0	52.7	359 41.5	8.7	23 33.8	2.7	56.3
17	78 51.1	53.6	14 09.2	8.7	23 36.5	2.5	56.3
18	93 51.2	S10 54.5	28 36.9	8.8	S23 39.0	2.4	56.3
19	108 51.3	55.4	43 04.7	8.7	23 41.4	2.3	56.2
20	123 51.4	56.2	57 32.4	8.8	23 43.7	2.1	56.2
21	138 51.5	. . 57.1	72 00.2	8.9	23 45.8	2.1	56.2
22	153 51.6	58.0	86 28.1	8.8	23 47.9	1.8	56.1
23	168 51.7	58.9	100 55.9	8.9	S23 49.7	1.8	56.1
	SD 16.1	d 0.9	SD 15.9		15.6		15.4

Lat.	Crepúsculo Náutico	Crepúsculo Civil	Orto Sol	Orto Luna 19	Orto Luna 20	Orto Luna 21	Orto Luna 22
°	h m	h m	h m	h m	h m	h m	h m
N 72	05 17	06 36	07 49	▬	▬	▬	▬
N 70	05 18	06 29	07 35	12 37	▬	▬	▬
68	05 19	06 24	07 23	11 49	14 36	▬	▬
66	05 20	06 19	07 13	11 19	13 17	15 18	▬
64	05 20	06 15	07 05	10 56	12 40	14 12	15 18
62	05 20	06 12	06 58	10 39	12 13	13 37	14 40
60	05 21	06 09	06 52	10 24	11 53	13 11	14 12
N 58	05 20	06 06	06 46	10 11	11 36	12 51	13 51
56	05 20	06 04	06 42	10 00	11 22	12 35	13 34
54	05 20	06 01	06 37	09 51	11 10	12 21	13 19
52	05 20	05 59	06 33	09 43	10 59	12 08	13 07
50	05 19	05 57	06 30	09 35	10 50	11 57	12 55
45	05 18	05 52	06 22	09 19	10 30	11 35	12 32
N 40	05 17	05 48	06 16	09 06	10 14	11 17	12 13
35	05 15	05 44	06 10	08 55	10 00	11 01	11 57
30	05 13	05 41	06 05	08 45	09 48	10 48	11 44
20	05 08	05 34	05 57	08 29	09 28	10 26	11 20
N 10	05 03	05 27	05 49	08 14	09 11	10 06	11 00
0	04 56	05 20	05 41	08 01	08 55	09 48	10 42
S 10	04 48	05 13	05 34	07 48	08 38	09 30	10 23
20	04 37	05 03	05 26	07 33	08 21	09 11	10 03
30	04 23	04 52	05 17	07 17	08 02	08 49	09 40
35	04 14	04 45	05 11	07 08	07 50	08 36	09 26
40	04 03	04 37	05 05	06 58	07 37	08 21	09 11
45	03 50	04 27	04 58	06 45	07 22	08 04	08 52
S 50	03 32	04 15	04 49	06 31	07 03	07 42	08 29
52	03 24	04 09	04 45	06 24	06 54	07 32	08 18
54	03 14	04 02	04 41	06 16	06 44	07 20	08 05
56	03 03	03 55	04 36	06 07	06 33	07 07	07 51
58	02 50	03 47	04 30	05 58	06 20	06 51	07 34
S 60	02 35	03 37	04 24	05 47	06 05	06 33	07 13

Lat.	Ocaso Sol	Crepúsculo Civil	Crepúsculo Náutico	Ocaso Luna 19	Ocaso Luna 20	Ocaso Luna 21	Ocaso Luna 22
°	h m	h m	h m	h m	h m	h m	h m
N 72	15 39	16 52	18 10	▬	▬	▬	▬
N 70	15 53	16 59	18 09	15 35	▬	▬	▬
68	16 05	17 04	18 09	16 23	15 30	▬	▬
66	16 15	17 09	18 08	16 55	16 49	16 40	▬
64	16 23	17 13	18 08	17 18	17 27	17 47	18 31
62	16 31	17 16	18 08	17 37	17 54	18 22	19 10
60	16 37	17 20	18 08	17 52	18 14	18 48	19 37
N 58	16 42	17 22	18 08	18 05	18 32	19 08	19 58
56	16 47	17 25	18 08	18 17	18 46	19 25	20 15
54	16 51	17 27	18 08	18 27	18 59	19 39	20 30
52	16 55	17 30	18 09	18 36	19 10	19 52	20 43
50	16 59	17 32	18 09	18 44	19 19	20 03	20 54
45	17 07	17 37	18 11	19 01	19 40	20 26	21 17
N 40	17 13	17 41	18 12	19 15	19 57	20 44	21 36
35	17 19	17 45	18 14	19 27	20 11	20 59	21 52
30	17 24	17 48	18 16	19 38	20 24	21 13	22 05
20	17 33	17 55	18 21	19 56	20 45	21 36	22 28
N 10	17 41	18 02	18 27	20 12	21 03	21 56	22 48
0	17 48	18 09	18 34	20 26	21 20	22 14	23 07
S 10	17 56	18 17	18 42	20 41	21 38	22 33	23 25
20	18 04	18 26	18 53	20 57	21 56	22 52	23 45
30	18 13	18 38	19 07	21 16	22 17	23 15	24 08
35	18 19	18 45	19 16	21 26	22 30	23 29	24 22
40	18 25	18 53	19 27	21 39	22 44	23 44	24 37
45	18 33	19 04	19 41	21 53	23 01	24 03	00 03
S 50	18 42	19 16	19 59	22 11	23 23	24 26	00 26
52	18 46	19 22	20 07	22 20	23 33	24 37	00 37
54	18 50	19 29	20 17	22 29	23 44	24 49	00 49
56	18 55	19 36	20 29	22 40	23 57	25 04	01 04
58	19 01	19 45	20 42	22 52	24 13	00 13	01 21
S 60	19 07	19 54	20 58	23 06	24 31	00 31	01 41

Día	SOL E.T. (+) 00h	SOL E.T. (+) 12h	SOL Pas. Mer.	LUNA Pas. Sup.	LUNA Mer. Inf.	LUNA Edad	LUNA Fase
d	m s	m s	h m	h m	h m	d	%
19	14 57	15 02	11 45	14 14	01 47	03	9
20	15 07	15 13	11 45	15 07	02 40	04	17
21	15 18	15 22	11 45	16 01	03 34	05	25

T.U.	ARIES	VENUS −3.9		MARTE −0.1		JUPITER −2.4		SATURNO −0.2	
d h	A.H.G.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.
	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
22 00	30 29.4	202 27.1	S 1 47.0	91 53.4	S23 14.1	283 43.4	N22 24.0	317 10.5	N20 40.4
01	45 31.9	217 26.7	48.2	106 54.1	13.7	298 45.8	24.0	332 13.1	40.3
02	60 34.4	232 26.3	49.4	121 54.8	13.3	313 48.1	24.0	347 15.7	40.3
03	75 36.8	247 25.9 . .	50.6	136 55.5 . .	12.9	328 50.5 . .	24.0	2 18.3 . .	40.3
04	90 39.3	262 25.5	51.8	151 56.1	12.5	343 52.9	24.0	17 20.9	40.3
05	105 41.7	277 25.1	53.1	166 56.8	12.2	358 55.2	24.0	32 23.4	40.3
06	120 44.2	292 24.7	S 1 54.3	181 57.5	S23 11.8	13 57.6	N22 24.0	47 26.0	N20 40.3
07	135 46.7	307 24.3	55.5	196 58.2	11.4	29 00.0	24.0	62 28.6	40.3
08	150 49.1	322 23.9	56.7	211 58.9	11.0	44 02.3	24.0	77 31.2	40.2
L 09	165 51.6	337 23.5 . .	57.9	226 59.5 . .	10.6	59 04.7 . .	23.9	92 33.8 . .	40.2
U 10	180 54.1	352 23.1	1 59.2	242 00.2	10.2	74 07.0	23.9	107 36.3	40.2
11	195 56.5	7 22.7	2 00.4	257 00.9	09.8	89 09.4	23.9	122 38.9	40.2
N 12	210 59.0	22 22.3	S 2 01.6	272 01.6	S23 09.5	104 11.8	N22 23.9	137 41.5	N20 40.2
13	226 01.5	37 21.9	02.8	287 02.3	09.1	119 14.1	23.9	152 44.1	40.2
E 14	241 03.9	52 21.5	04.0	302 03.0	08.7	134 16.5	23.9	167 46.7	40.1
S 15	256 06.4	67 21.1 . .	05.3	317 03.6 . .	08.3	149 18.9 . .	23.9	182 49.3 . .	40.1
16	271 08.8	82 20.7	06.5	332 04.3	07.9	164 21.2	23.9	197 51.8	40.1
17	286 11.3	97 20.3	07.7	347 05.0	07.5	179 23.6	23.9	212 54.4	40.1
18	301 13.8	112 20.0	S 2 08.9	2 05.7	S23 07.1	194 26.0	N22 23.9	227 57.0	N20 40.1
19	316 16.2	127 19.6	10.1	17 06.4	06.7	209 28.3	23.9	242 59.6	40.1
20	331 18.7	142 19.2	11.3	32 07.0	06.4	224 30.7	23.9	258 02.2	40.0
21	346 21.2	157 18.8 . .	12.6	47 07.7 . .	06.0	239 33.1 . .	23.9	273 04.8 . .	40.0
22	1 23.6	172 18.4	13.8	62 08.4	05.6	254 35.5	23.9	288 07.3	40.0
23	16 26.1	187 18.0	15.0	77 09.1	05.2	269 37.8	23.9	303 09.9	40.0
23 00	31 28.6	202 17.6	S 2 16.2	92 09.8	S23 04.8	284 40.2	N22 23.8	318 12.5	N20 40.0
01	46 31.0	217 17.2	17.4	107 10.5	04.4	299 42.6	23.8	333 15.1	40.0
02	61 33.5	232 16.8	18.7	122 11.1	04.0	314 44.9	23.8	348 17.7	39.9
03	76 36.0	247 16.4 . .	19.9	137 11.8 . .	03.6	329 47.3 . .	23.8	3 20.3 . .	39.9
04	91 38.4	262 16.0	21.1	152 12.5	03.2	344 49.7	23.8	18 22.8	39.9
05	106 40.9	277 15.6	22.3	167 13.2	02.8	359 52.0	23.8	33 25.4	39.9
06	121 43.3	292 15.2	S 2 23.5	182 13.9	S23 02.4	14 54.4	N22 23.8	48 28.0	N20 39.9
07	136 45.8	307 14.8	24.7	197 14.5	02.1	29 56.8	23.8	63 30.6	39.9
M 08	151 48.3	322 14.4	26.0	212 15.2	01.7	44 59.2	23.8	78 33.2	39.8
A 09	166 50.7	337 14.0 . .	27.2	227 15.9 . .	01.3	60 01.5 . .	23.8	93 35.8 . .	39.8
R 10	181 53.2	352 13.6	28.4	242 16.6	00.9	75 03.9	23.8	108 38.4	39.8
11	196 55.7	7 13.2	29.6	257 17.3	00.5	90 06.3	23.8	123 40.9	39.8
T 12	211 58.1	22 12.8	S 2 30.8	272 17.9	S23 00.1	105 08.7	N22 23.8	138 43.5	N20 39.8
13	227 00.6	37 12.4	32.1	287 18.6	22 59.7	120 11.0	23.8	153 46.1	39.8
E 14	242 03.1	52 12.0	33.3	302 19.3	59.3	135 13.4	23.8	168 48.7	39.7
S 15	257 05.5	67 11.6 . .	34.5	317 20.0 . .	58.9	150 15.8 . .	23.8	183 51.3 . .	39.7
16	272 08.0	82 11.2	35.7	332 20.7	58.5	165 18.2	23.8	198 53.9	39.7
17	287 10.5	97 10.8	36.9	347 21.3	58.1	180 20.5	23.8	213 56.5	39.7
18	302 12.9	112 10.4	S 2 38.1	2 22.0	S22 57.7	195 22.9	N22 23.7	228 59.1	N20 39.7
19	317 15.4	127 10.0	39.4	17 22.7	57.3	210 25.3	23.7	244 01.6	39.7
20	332 17.8	142 09.6	40.6	32 23.4	56.9	225 27.7	23.7	259 04.2	39.6
21	347 20.3	157 09.2 . .	41.8	47 24.1 . .	56.5	240 30.0 . .	23.7	274 06.8 . .	39.6
22	2 22.8	172 08.8	43.0	62 24.7	56.1	255 32.4	23.7	289 09.4	39.6
23	17 25.2	187 08.4	44.2	77 25.4	55.7	270 34.8	23.7	304 12.0	39.6
24 00	32 27.7	202 08.0	S 2 45.5	92 26.1	S22 55.3	285 37.2	N22 23.7	319 14.6	N20 39.6
01	47 30.2	217 07.6	46.7	107 26.8	54.9	300 39.6	23.7	334 17.2	39.6
02	62 32.6	232 07.2	47.9	122 27.5	54.5	315 41.9	23.7	349 19.8	39.5
03	77 35.1	247 06.8 . .	49.1	137 28.1 . .	54.1	330 44.3 . .	23.7	4 22.3 . .	39.5
04	92 37.6	262 06.4	50.3	152 28.8	53.7	345 46.7	23.7	19 24.9	39.5
05	107 40.0	277 06.0	51.5	167 29.5	53.3	0 49.1	23.7	34 27.5	39.5
06	122 42.5	292 05.6	S 2 52.8	182 30.2	S22 52.9	15 51.5	N22 23.7	49 30.1	N20 39.5
M 07	137 45.0	307 05.1	54.0	197 30.9	52.5	30 53.8	23.7	64 32.7	39.5
I 08	152 47.4	322 04.7	55.2	212 31.5	52.1	45 56.2	23.7	79 35.3	39.4
E 09	167 49.9	337 04.3 . .	56.4	227 32.2 . .	51.7	60 58.6 . .	23.7	94 37.9 . .	39.4
R 10	182 52.3	352 03.9	57.6	242 32.9	51.3	76 01.0	23.7	109 40.5	39.4
C 11	197 54.8	7 03.5	2 58.8	257 33.6	50.9	91 03.4	23.7	124 43.1	39.4
O 12	212 57.3	22 03.1	S 3 00.1	272 34.3	S22 50.5	106 05.7	N22 23.7	139 45.7	N20 39.4
L 13	227 59.7	37 02.7	01.3	287 34.9	50.1	121 08.1	23.7	154 48.2	39.4
E 14	243 02.2	52 02.3	02.5	302 35.6	49.7	136 10.5	23.6	169 50.8	39.3
S 15	258 04.7	67 01.9 . .	03.7	317 36.3 . .	49.3	151 12.9 . .	23.6	184 53.4 . .	39.3
16	273 07.1	82 01.5	04.9	332 37.0	48.9	166 15.3	23.6	199 56.0	39.3
17	288 09.6	97 01.1	06.1	347 37.7	48.5	181 17.7	23.6	214 58.6	39.3
18	303 12.1	112 00.7	S 3 07.4	2 38.3	S22 48.1	196 20.0	N22 23.6	230 01.2	N20 39.3
19	318 14.5	127 00.3	08.6	17 39.0	47.7	211 22.4	23.6	245 03.8	39.3
20	333 17.0	141 59.9	09.8	32 39.7	47.3	226 24.8	23.6	260 06.4	39.2
21	348 19.4	156 59.5 . .	11.0	47 40.4 . .	46.9	241 27.2 . .	23.6	275 09.0 . .	39.2
22	3 21.9	171 59.1	12.2	62 41.0	46.5	256 29.6	23.6	290 11.6	39.2
23	18 24.4	186 58.7	13.4	77 41.7	46.1	271 32.0	23.6	305 14.2	39.2
	h m								
Pas. Mer.	21 50.5	v −0.4	d 1.2	v 0.7	d 0.4	v 2.4	d 0.0	v 2.6	d 0.0

ESTRELLAS

Nombre	A.H.S.	Dec.
	° ′	° ′
Acamar	315 24.8	S40 17.8
Achernar	335 32.9	S57 13.7
Acrux	173 20.4	S63 06.3
Adhara	255 19.6	S28 58.2
Aldebaran	290 59.7	N16 30.8
Alioth	166 29.1	N55 57.1
Alkaid	153 06.5	N49 18.4
Al Na'ir	27 54.9	S46 57.4
Alnilam	275 55.5	S 1 11.9
Alphard	218 05.2	S 8 39.7
Alphecca	126 19.1	N26 42.7
Alpheratz	357 52.7	N29 06.1
Altair	62 17.2	N 8 52.5
Ankaa	353 24.3	S42 17.9
Antares	112 37.9	S26 26.1
Arcturus	146 04.4	N19 10.6
Atria	107 48.4	S69 02.0
Avior	234 21.9	S59 30.5
Bellatrix	278 41.7	N 6 21.1
Betelgeuse	271 11.1	N 7 24.5
Canopus	264 00.0	S52 41.5
Capella	280 47.7	N45 59.9
Deneb	49 37.7	N45 17.4
Denebola	182 43.3	N14 33.9
Diphda	349 04.8	S17 58.6
Dubhe	194 03.2	N61 44.4
Elnath	278 24.0	N28 36.5
Eltanin	90 50.7	N51 29.6
Enif	33 56.0	N 9 53.1
Fomalhaut	15 33.8	S29 36.9
Gacrux	172 11.8	S57 07.1
Gienah	176 02.1	S17 32.8
Hadar	149 01.8	S60 22.7
Hamal	328 10.8	N23 28.3
Kaus Aust.	83 56.2	S34 23.1
Kochab	137 20.6	N74 09.1
Markab	13 47.3	N15 13.0
Menkar	314 24.4	N 4 05.8
Menkent	148 18.9	S36 22.5
Miaplacidus	221 42.0	S69 43.1
Mirfak	308 53.1	N49 52.0
Nunki	76 09.8	S26 17.7
Peacock	53 33.5	S56 44.0
Pollux	243 38.9	N28 01.3
Procyon	245 09.3	N 5 13.4
Rasalhague	96 15.2	N12 33.7
Regulus	207 53.4	N11 57.7
Rigel	281 20.7	S 8 11.9
Rigil Kent.	140 05.2	S60 50.4
Sabik	102 23.3	S15 43.5
Schedar	349 50.6	N56 32.9
Shaula	96 34.7	S37 06.3
Sirius	258 41.7	S16 42.9
Spica	158 41.3	S11 10.0
Suhail	222 59.4	S43 26.0
Vega	80 45.4	N38 47.4
Zuben'ubi	137 16.0	S16 02.8

	A.H.S.	Pas. Mer.
	° ′	h m
Venus	170 49.0	10 31
Marte	60 41.2	17 51
Júpiter	253 11.6	5 01
Saturno	286 43.9	2 47

(LUN., MAR., MIE.) 22, 23, 24 OCTUBRE DEL 2001

T.U.	SOL				LUNA					
	A.H.G.		Dec.		A.H.G.	v	Dec.		d	P.H.
d h	°	′	°	′	°	′	°	′	′	′
22 00	183	51.8	S10	59.8	115	23.8	8.9	S23	51.5	1.6	56.1
01	198	51.9	11	00.7	129	51.7	8.9	23	53.1	1.5	56.0
02	213	52.0		01.6	144	19.6	9.0	23	54.6	1.3	56.0
03	228	52.1	. .	02.4	158	47.6	9.0	23	55.9	1.3	56.0
04	243	52.2		03.3	173	15.6	9.0	23	57.2	1.1	55.9
05	258	52.3		04.2	187	43.6	9.0	23	58.3	0.9	55.9
06	273	52.4	S11	05.1	202	11.6	9.1	S23	59.2	0.9	55.9
07	288	52.5		06.0	216	39.7	9.1	24	00.1	0.7	55.9
L 08	303	52.5		06.9	231	07.8	9.2	24	00.8	0.6	55.8
09	318	52.6	. .	07.7	245	36.0	9.2	24	01.4	0.4	55.8
U 10	333	52.7		08.6	260	04.2	9.2	24	01.8	0.4	55.8
11	348	52.8		09.5	274	32.4	9.2	24	02.2	0.2	55.7
N 12	3	52.9	S11	10.4	289	00.6	9.3	S24	02.4	0.1	55.7
E 13	18	53.0		11.3	303	28.9	9.3	24	02.5	0.1	55.7
14	33	53.1		12.1	317	57.2	9.4	24	02.4	0.2	55.6
S 15	48	53.2	. .	13.0	332	25.6	9.4	24	02.2	0.3	55.6
16	63	53.3		13.9	346	54.0	9.5	24	01.9	0.4	55.6
17	78	53.4		14.8	1	22.5	9.4	24	01.5	0.5	55.6
18	93	53.5	S11	15.7	15	50.9	9.6	S24	01.0	0.7	55.5
19	108	53.6		16.5	30	19.5	9.5	24	00.3	0.8	55.5
20	123	53.6		17.4	44	48.0	9.6	23	59.5	0.9	55.5
21	138	53.7	. .	18.3	59	16.6	9.7	23	58.6	1.1	55.5
22	153	53.8		19.2	73	45.3	9.7	23	57.5	1.1	55.4
23	168	53.9		20.1	88	14.0	9.7	23	56.4	1.3	55.4
23 00	183	54.0	S11	20.9	102	42.7	9.8	S23	55.1	1.4	55.4
01	198	54.1		21.8	117	11.5	9.8	23	53.7	1.6	55.3
02	213	54.2		22.7	131	40.3	9.9	23	52.1	1.6	55.3
03	228	54.3	. .	23.6	146	09.2	9.9	23	50.5	1.8	55.3
04	243	54.4		24.4	160	38.1	10.0	23	48.7	1.9	55.3
05	258	54.4		25.3	175	07.1	10.0	23	46.8	2.0	55.2
06	273	54.5	S11	26.2	189	36.1	10.1	S23	44.8	2.1	55.2
07	288	54.6		27.1	204	05.2	10.1	23	42.7	2.2	55.2
M 08	303	54.7		27.9	218	34.3	10.2	23	40.5	2.4	55.2
A 09	318	54.8	. .	28.8	233	03.5	10.2	23	38.1	2.5	55.1
R 10	333	54.9		29.7	247	32.7	10.2	23	35.6	2.5	55.1
11	348	55.0		30.6	262	01.9	10.4	23	33.1	2.8	55.1
T 12	3	55.0	S11	31.4	276	31.3	10.3	S23	30.3	2.8	55.1
13	18	55.1		32.3	291	00.6	10.5	23	27.5	2.9	55.1
E 14	33	55.2		33.2	305	30.1	10.4	23	24.6	3.0	55.0
S 15	48	55.3	. .	34.1	319	59.5	10.6	23	21.6	3.2	55.0
16	63	55.4		34.9	334	29.1	10.5	23	18.4	3.3	55.0
17	78	55.5		35.8	348	58.6	10.7	23	15.1	3.3	55.0
18	93	55.5	S11	36.7	3	28.3	10.7	S23	11.8	3.5	54.9
19	108	55.6		37.6	17	58.0	10.7	23	08.3	3.6	54.9
20	123	55.7		38.4	32	27.7	10.8	23	04.7	3.7	54.9
21	138	55.8	. .	39.3	46	57.5	10.9	23	01.0	3.9	54.9
22	153	55.9		40.2	61	27.4	10.9	22	57.1	3.9	54.9
23	168	56.0		41.0	75	57.3	10.9	22	53.2	4.0	54.8
24 00	183	56.0	S11	41.9	90	27.2	11.0	S22	49.2	4.2	54.8
01	198	56.1		42.8	104	57.2	11.1	22	45.0	4.2	54.8
02	213	56.2		43.6	119	27.3	11.2	22	40.8	4.4	54.8
03	228	56.3	. .	44.5	133	57.5	11.2	22	36.4	4.4	54.8
04	243	56.4		45.4	148	27.7	11.2	22	32.0	4.6	54.7
05	258	56.4		46.3	162	57.9	11.3	22	27.4	4.6	54.7
06	273	56.5	S11	47.1	177	28.2	11.4	S22	22.8	4.8	54.7
M 07	288	56.6		48.0	191	58.6	11.4	22	18.0	4.9	54.7
I 08	303	56.7		48.9	206	29.0	11.5	22	13.1	4.9	54.7
E 09	318	56.8	. .	49.7	220	59.5	11.5	22	08.2	5.1	54.7
R 10	333	56.8		50.6	235	30.0	11.6	22	03.1	5.2	54.6
11	348	56.9		51.5	250	00.6	11.6	21	57.9	5.2	54.6
C 12	3	57.0	S11	52.3	264	31.2	11.7	S21	52.7	5.4	54.6
O 13	18	57.1		53.2	279	01.9	11.8	21	47.3	5.5	54.6
L 14	33	57.1		54.1	293	32.7	11.8	21	41.8	5.5	54.6
E 15	48	57.2	. .	54.9	308	03.5	11.9	21	36.3	5.7	54.6
S 16	63	57.3		55.8	322	34.4	12.0	21	30.6	5.7	54.5
17	78	57.4		56.7	337	05.4	12.0	21	24.9	5.9	54.5
18	93	57.5	S11	57.5	351	36.4	12.0	S21	19.0	5.9	54.5
19	108	57.5		58.4	6	07.4	12.1	21	13.1	6.1	54.5
20	123	57.6	11	59.3	20	38.5	12.2	21	07.0	6.1	54.5
21	138	57.7	12	00.1	35	09.7	12.2	21	00.9	6.2	54.5
22	153	57.8		01.0	49	40.9	12.3	20	54.7	6.3	54.5
23	168	57.8		01.8	64	12.2	12.4	S20	48.4	6.5	54.4
	SD	16.1	d	0.9	SD		15.2		15.0		14.9

Lat.	Crepúsculo Náutico	Crepúsculo Civil	Orto Sol	Orto Luna 22	Orto Luna 23	Orto Luna 24	Orto Luna 25
°	h m	h m	h m	h m	h m	h m	h m
N 72	05 30	06 49	08 05	▬	▬	▬	▬
N 70	05 30	06 41	07 48	▬	▬	▬	17 50
68	05 29	06 34	07 34	▬	▬	▬	17 06
66	05 29	06 29	07 23	▬	16 48	16 41	16 36
64	05 28	06 24	07 14	15 18	15 52	16 07	16 13
62	05 28	06 20	07 06	14 40	15 19	15 42	15 55
60	05 27	06 16	06 59	14 12	14 55	15 22	15 40
N 58	05 27	06 13	06 53	13 51	14 35	15 06	15 28
56	05 26	06 09	06 48	13 34	14 19	14 52	15 17
54	05 25	06 07	06 43	13 19	14 05	14 40	15 07
52	05 25	06 04	06 39	13 07	13 53	14 30	14 58
50	05 24	06 02	06 35	12 55	13 43	14 20	14 50
45	05 22	05 56	06 26	12 32	13 20	14 00	14 34
N 40	05 20	05 51	06 19	12 13	13 02	13 44	14 20
35	05 17	05 47	06 13	11 57	12 47	13 30	14 08
30	05 15	05 43	06 07	11 44	12 34	13 18	13 58
20	05 09	05 35	05 58	11 20	12 11	12 58	13 40
N 10	05 03	05 28	05 49	11 00	11 52	12 40	13 25
0	04 55	05 20	05 41	10 42	11 33	12 23	13 10
S 10	04 46	05 11	05 33	10 23	11 15	12 06	12 56
20	04 35	05 01	05 24	10 03	10 56	11 48	12 40
30	04 20	04 49	05 14	09 40	10 33	11 28	12 22
35	04 10	04 41	05 08	09 26	10 20	11 15	12 12
40	03 58	04 32	05 01	09 11	10 05	11 01	12 00
45	03 44	04 22	04 53	08 52	09 46	10 45	11 46
S 50	03 25	04 08	04 43	08 29	09 24	10 24	11 28
52	03 16	04 02	04 39	08 18	09 13	10 14	11 20
54	03 06	03 55	04 34	08 05	09 01	10 03	11 11
56	02 54	03 47	04 28	07 51	08 46	09 51	11 01
58	02 39	03 38	04 22	07 34	08 30	09 36	10 49
S 60	02 22	03 27	04 15	07 13	08 10	09 19	10 35

Lat.	Ocaso Sol	Crepúsculo Civil	Crepúsculo Náutico	Ocaso Luna 22	Ocaso Luna 23	Ocaso Luna 24	Ocaso Luna 25
°	h m	h m	h m	h m	h m	h m	h m
N 72	15 22	16 38	17 57	▬	▬	▬	▬
N 70	15 39	16 46	17 57	▬	▬	▬	21 06
68	15 53	16 53	17 58	▬	▬	19 40	21 50
66	16 04	16 58	17 58	▬	18 49	20 37	22 19
64	16 13	17 03	17 59	18 31	19 44	21 11	22 40
62	16 21	17 08	17 59	19 10	20 16	21 35	22 58
60	16 28	17 12	18 00	19 37	20 40	21 54	23 12
N 58	16 34	17 15	18 01	19 58	21 00	22 10	23 24
56	16 40	17 18	18 01	20 15	21 16	22 23	23 35
54	16 45	17 21	18 02	20 30	21 29	22 35	23 44
52	16 49	17 24	18 03	20 43	21 41	22 45	23 52
50	16 53	17 26	18 04	20 54	21 52	22 55	24 00
45	17 02	17 32	18 06	21 17	22 14	23 14	24 15
N 40	17 09	17 37	18 08	21 36	22 32	23 29	24 28
35	17 15	17 41	18 11	21 52	22 46	23 43	24 39
30	17 21	17 45	18 13	22 05	22 59	23 54	24 49
20	17 31	17 53	18 19	22 28	23 21	24 14	00 14
N 10	17 39	18 01	18 26	22 48	23 40	24 30	00 30
0	17 48	18 09	18 33	23 07	23 58	24 46	00 46
S 10	17 56	18 18	18 43	23 25	24 15	00 15	01 02
20	18 05	18 28	18 54	23 45	24 34	00 34	01 19
30	18 16	18 40	19 10	24 08	00 08	00 56	01 38
35	18 22	18 48	19 19	24 22	00 22	01 08	01 49
40	18 29	18 57	19 31	24 37	00 37	01 23	02 01
45	18 37	19 08	19 46	00 03	00 56	01 40	02 16
S 50	18 47	19 21	20 05	00 26	01 18	02 01	02 35
52	18 51	19 28	20 14	00 37	01 29	02 11	02 43
54	18 56	19 35	20 25	00 49	01 42	02 22	02 53
56	19 02	19 43	20 37	01 04	01 56	02 35	03 04
58	19 08	19 53	20 52	01 21	02 13	02 50	03 16
S 60	19 15	20 03	21 10	01 41	02 33	03 08	03 30

Día	SOL E.T. (+) 00h	SOL E.T. (+) 12h	Pas. Mer.	LUNA Pas. Mer. Sup.	LUNA Pas. Mer. Inf.	Edad	Fase
d	m s	m s	h m	h m	h m	d	%
22	15 27	15 31	11 44	16 54	04 28	06	34
23	15 36	15 40	11 44	17 46	05 20	07	44
24	15 44	15 48	11 44	18 35	06 10	08	54

(JUE., VIE., SAB.) 25, 26, 27 OCTUBRE DEL 2001

T.U.	ARIES	VENUS −3.9		MARTE +0.0		JUPITER −2.4		SATURNO −0.2	
	A.H.G.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
25 00	33 26.8	201 58.3	S 3 14.7	92 42.4	S22 45.7	286 34.4	N22 23.6	320 16.8	N20 39.2
01	48 29.3	216 57.9	15.9	107 43.1	45.3	301 36.8	23.6	335 19.3	39.2
02	63 31.8	231 57.5	17.1	122 43.8	44.8	316 39.1	23.6	350 21.9	39.1
03	78 34.2	246 57.1	. . 18.3	137 44.4	. . 44.4	331 41.5	. . 23.6	5 24.5	. . 39.1
04	93 36.7	261 56.7	19.5	152 45.1	44.0	346 43.9	23.6	20 27.1	39.1
05	108 39.2	276 56.3	20.7	167 45.8	43.6	1 46.3	23.6	35 29.7	39.1
06	123 41.6	291 55.9	S 3 21.9	182 46.5	S22 43.2	16 48.7	N22 23.6	50 32.3	N20 39.1
07	138 44.1	306 55.5	23.2	197 47.1	42.8	31 51.1	23.6	65 34.9	39.1
J 08	153 46.6	321 55.0	24.4	212 47.8	42.4	46 53.5	23.6	80 37.5	39.0
09	168 49.0	336 54.6	. . 25.6	227 48.5	. . 42.0	61 55.9	. . 23.6	95 40.1	. . 39.0
U 10	183 51.5	351 54.2	26.8	242 49.2	41.6	76 58.3	23.6	110 42.7	39.0
E 11	198 53.9	6 53.8	28.0	257 49.9	41.2	92 00.6	23.6	125 45.3	39.0
12	213 56.4	21 53.4	S 3 29.2	272 50.5	S22 40.8	107 03.0	N22 23.6	140 47.9	N20 39.0
V 13	228 58.9	36 53.0	30.5	287 51.2	40.3	122 05.4	23.6	155 50.5	39.0
E 14	244 01.3	51 52.6	31.7	302 51.9	39.9	137 07.8	23.6	170 53.1	38.9
15	259 03.8	66 52.2	. . 32.9	317 52.6	. . 39.5	152 10.2	. . 23.5	185 55.7	. . 38.9
S 16	274 06.3	81 51.8	34.1	332 53.2	39.1	167 12.6	23.5	200 58.3	38.9
17	289 08.7	96 51.4	35.3	347 53.9	38.7	182 15.0	23.5	216 00.9	38.9
18	304 11.2	111 51.0	S 3 36.5	2 54.6	S22 38.3	197 17.4	N22 23.5	231 03.4	N20 38.9
19	319 13.7	126 50.6	37.7	17 55.3	37.9	212 19.8	23.5	246 06.0	38.8
20	334 16.1	141 50.2	39.0	32 56.0	37.5	227 22.2	23.5	261 08.6	38.8
21	349 18.6	156 49.8	. . 40.2	47 56.6	. . 37.0	242 24.6	. . 23.5	276 11.2	. . 38.8
22	4 21.1	171 49.3	41.4	62 57.3	36.6	257 27.0	23.5	291 13.8	38.8
23	19 23.5	186 48.9	42.6	77 58.0	36.2	272 29.4	23.5	306 16.4	38.8
26 00	34 26.0	201 48.5	S 3 43.8	92 58.7	S22 35.8	287 31.8	N22 23.5	321 19.0	N20 38.8
01	49 28.4	216 48.1	45.0	107 59.3	35.4	302 34.2	23.5	336 21.6	38.7
02	64 30.9	231 47.7	46.2	123 00.0	35.0	317 36.6	23.5	351 24.2	38.7
03	79 33.4	246 47.3	. . 47.5	138 00.7	. . 34.5	332 39.0	. . 23.5	6 26.8	. . 38.7
04	94 35.8	261 46.9	48.7	153 01.4	34.1	347 41.4	23.5	21 29.4	38.7
05	109 38.3	276 46.5	49.9	168 02.1	33.7	2 43.8	23.5	36 32.0	38.7
06	124 40.8	291 46.1	S 3 51.1	183 02.7	S22 33.3	17 46.1	N22 23.5	51 34.6	N20 38.7
07	139 43.2	306 45.7	52.3	198 03.4	32.9	32 48.5	23.5	66 37.2	38.6
V 08	154 45.7	321 45.3	53.5	213 04.1	32.5	47 50.9	23.5	81 39.8	38.6
I 09	169 48.2	336 44.8	. . 54.7	228 04.8	. . 32.0	62 53.3	. . 23.5	96 42.4	. . 38.6
E 10	184 50.6	351 44.4	55.9	243 05.4	31.6	77 55.7	23.5	111 45.0	38.6
R 11	199 53.1	6 44.0	57.2	258 06.1	31.2	92 58.1	23.5	126 47.6	38.6
12	214 55.5	21 43.6	S 3 58.4	273 06.8	S22 30.8	108 00.5	N22 23.5	141 50.2	N20 38.6
N 13	229 58.0	36 43.2	3 59.6	288 07.5	30.4	123 02.9	23.5	156 52.8	38.5
E 14	245 00.5	51 42.8	4 00.8	303 08.1	30.0	138 05.3	23.5	171 55.4	38.5
S 15	260 02.9	66 42.4	. . 02.0	318 08.8	. . 29.5	153 07.7	. . 23.5	186 58.0	. . 38.5
16	275 05.4	81 42.0	03.2	333 09.5	29.1	168 10.1	23.5	202 00.6	38.5
17	290 07.9	96 41.6	04.4	348 10.2	28.7	183 12.6	23.5	217 03.2	38.5
18	305 10.3	111 41.2	S 4 05.6	3 10.8	S22 28.3	198 15.0	N22 23.5	232 05.8	N20 38.4
19	320 12.8	126 40.7	06.9	18 11.5	27.8	213 17.4	23.5	247 08.4	38.4
20	335 15.3	141 40.3	08.1	33 12.2	27.4	228 19.8	23.5	262 11.0	38.4
21	350 17.7	156 39.9	. . 09.3	48 12.9	. . 27.0	243 22.2	. . 23.5	277 13.6	. . 38.4
22	5 20.2	171 39.5	10.5	63 13.6	26.6	258 24.6	23.5	292 16.2	38.4
23	20 22.7	186 39.1	11.7	78 14.2	26.2	273 27.0	23.5	307 18.8	38.4
27 00	35 25.1	201 38.7	S 4 12.9	93 14.9	S22 25.7	288 29.4	N22 23.5	322 21.4	N20 38.3
01	50 27.6	216 38.3	14.1	108 15.6	25.3	303 31.8	23.4	337 24.0	38.3
02	65 30.0	231 37.9	15.3	123 16.3	24.9	318 34.2	23.4	352 26.6	38.3
03	80 32.5	246 37.4	. . 16.6	138 16.9	. . 24.5	333 36.6	. . 23.4	7 29.2	. . 38.3
04	95 35.0	261 37.0	17.8	153 17.6	24.0	348 39.0	23.4	22 31.8	38.3
05	110 37.4	276 36.6	19.0	168 18.3	23.6	3 41.4	23.4	37 34.4	38.3
06	125 39.9	291 36.2	S 4 20.2	183 19.0	S22 23.2	18 43.8	N22 23.4	52 37.0	N20 38.2
07	140 42.4	306 35.8	21.4	198 19.6	22.8	33 46.2	23.4	67 39.6	38.2
S 08	155 44.8	321 35.4	22.6	213 20.3	22.3	48 48.6	23.4	82 42.2	38.2
A 09	170 47.3	336 35.0	. . 23.8	228 21.0	. . 21.9	63 51.0	. . 23.4	97 44.8	. . 38.2
10	185 49.8	351 34.5	25.0	243 21.7	21.5	78 53.4	23.4	112 47.4	38.2
B 11	200 52.2	6 34.1	26.2	258 22.3	21.1	93 55.8	23.4	127 50.0	38.1
12	215 54.7	21 33.7	S 4 27.4	273 23.0	S22 20.6	108 58.3	N22 23.4	142 52.6	N20 38.1
A 13	230 57.1	36 33.3	28.7	288 23.7	20.2	124 00.7	23.4	157 55.2	38.1
D 14	245 59.6	51 32.9	29.9	303 24.4	19.8	139 03.1	23.4	172 57.8	38.1
15	261 02.1	66 32.5	. . 31.1	318 25.0	. . 19.4	154 05.5	. . 23.4	188 00.4	. . 38.1
O 16	276 04.5	81 32.1	32.3	333 25.7	18.9	169 07.9	23.4	203 03.0	38.1
17	291 07.0	96 31.6	33.5	348 26.4	18.5	184 10.3	23.4	218 05.6	38.0
18	306 09.5	111 31.2	S 4 34.7	3 27.1	S22 18.1	199 12.7	N22 23.4	233 08.2	N20 38.0
19	321 11.9	126 30.8	35.9	18 27.7	17.6	214 15.1	23.4	248 10.8	38.0
20	336 14.4	141 30.4	37.1	33 28.4	17.2	229 17.5	23.4	263 13.4	38.0
21	351 16.9	156 30.0	. . 38.3	48 29.1	. . 16.8	244 20.0	. . 23.4	278 16.0	. . 38.0
22	6 19.3	171 29.6	39.5	63 29.8	16.3	259 22.4	23.4	293 18.6	37.9
23	21 21.8	186 29.1	40.8	78 30.4	15.9	274 24.8	23.4	308 21.2	37.9
	h m								
Pas. Mer.	21 38.7	v −0.4	d 1.2	v 0.7	d 0.4	v 2.4	d 0.0	v 2.6	d 0.0

ESTRELLAS

Nombre	A.H.S.	Dec.
	° ′	° ′
Acamar	315 24.8	S40 17.8
Achernar	335 32.9	S57 13.8
Acrux	173 20.4	S63 06.2
Adhara	255 19.6	S28 58.2
Aldebaran	290 59.7	N16 30.8
Alioth	166 29.1	N55 57.1
Alkaid	153 06.5	N49 18.4
Al Na'ir	27 54.9	S46 57.4
Alnilam	275 55.5	S 1 11.9
Alphard	218 05.2	S 8 39.7
Alphecca	126 19.1	N26 42.7
Alpheratz	357 52.7	N29 06.1
Altair	62 17.2	N 8 52.5
Ankaa	353 24.3	S42 17.9
Antares	112 37.9	S26 26.1
Arcturus	146 04.4	N19 10.6
Atria	107 48.4	S69 02.0
Avior	234 21.8	S59 30.5
Bellatrix	278 41.6	N 6 21.1
Betelgeuse	271 11.0	N 7 24.5
Canopus	264 00.0	S52 41.5
Capella	280 47.7	N45 59.9
Deneb	49 37.7	N45 17.4
Denebola	182 43.3	N14 33.9
Diphda	349 04.8	S17 58.7
Dubhe	194 03.2	N61 44.4
Elnath	278 24.0	N28 36.5
Eltanin	90 50.7	N51 29.6
Enif	33 56.0	N 9 53.1
Fomalhaut	15 33.8	S29 36.9
Gacrux	172 11.8	S57 07.1
Gienah	176 02.1	S17 32.8
Hadar	149 01.8	S60 22.7
Hamal	328 10.8	N23 28.3
Kaus Aust.	83 56.2	S34 23.1
Kochab	137 20.6	N74 09.0
Markab	13 47.3	N15 13.0
Menkar	314 24.3	N 4 05.8
Menkent	148 18.9	S36 22.5
Miaplacidus	221 42.0	S69 43.1
Mirfak	308 53.1	N49 52.0
Nunki	76 09.8	S26 17.7
Peacock	53 33.6	S56 44.0
Pollux	243 38.9	N28 01.3
Procyon	245 09.3	N 5 13.4
Rasalhague	96 15.2	N12 33.7
Regulus	207 53.4	N11 57.7
Rigel	281 20.6	S 8 11.9
Rigil Kent.	140 05.2	S60 50.4
Sabik	102 23.3	S15 43.5
Schedar	349 50.6	N56 32.9
Shaula	96 34.7	S37 06.3
Sirius	258 41.7	S16 42.9
Spica	158 41.3	S11 10.0
Suhail	222 59.3	S43 26.0
Vega	80 45.4	N38 47.4
Zuben'ubi	137 15.9	S16 02.8

	A.H.S.	Pas. Mer.
	° ′	h m
Venus	167 22.6	10 33
Marte	58 32.7	17 47
Júpiter	253 05.8	4 49
Saturno	286 53.0	2 34

T.U.	SOL				LUNA					
	A.H.G.		Dec.		A.H.G.	v	Dec.	d	P.H.	
d h	°	′	°	′	°	′	°	′	′	′
25 00	183	57.9	S12	02.7	78	43.6	12.4	S20	41.9	6.4	54.4
01	198	58.0		03.6	93	15.0	12.4	20	35.5	6.6	54.4
02	213	58.0		04.4	107	46.4	12.6	20	28.9	6.7	54.4
03	228	58.1	. .	05.3	122	18.0	12.5	20	22.2	6.8	54.4
04	243	58.2		06.2	136	49.5	12.7	20	15.4	6.8	54.4
05	258	58.3		07.0	151	21.2	12.7	20	08.6	7.0	54.4
06	273	58.3	S12	07.9	165	52.9	12.7	S20	01.6	7.0	54.4
07	288	58.4		08.7	180	24.6	12.8	19	54.6	7.1	54.3
J 08	303	58.5		09.6	194	56.4	12.9	19	47.5	7.2	54.3
U 09	318	58.6	. .	10.5	209	28.3	12.9	19	40.3	7.3	54.3
10	333	58.6		11.3	224	00.2	13.0	19	33.0	7.3	54.3
E 11	348	58.7		12.2	238	32.2	13.0	19	25.7	7.5	54.3
V 12	3	58.8	S12	13.0	253	04.2	13.1	S19	18.2	7.5	54.3
13	18	58.8		13.9	267	36.3	13.1	19	10.7	7.6	54.3
E 14	33	58.9		14.8	282	08.4	13.2	19	03.1	7.7	54.3
S 15	48	59.0	. .	15.6	296	40.6	13.3	18	55.4	7.7	54.3
16	63	59.0		16.5	311	12.9	13.3	18	47.7	7.9	54.3
17	78	59.1		17.3	325	45.2	13.3	18	39.8	7.9	54.3
18	93	59.2	S12	18.2	340	17.5	13.4	S18	31.9	8.0	54.2
19	108	59.3		19.0	354	49.9	13.5	18	23.9	8.1	54.2
20	123	59.3		19.9	9	22.4	13.5	18	15.8	8.1	54.2
21	138	59.4	. .	20.8	23	54.9	13.6	18	07.7	8.3	54.2
22	153	59.5		21.6	38	27.5	13.6	17	59.4	8.3	54.2
23	168	59.5		22.5	53	00.1	13.7	17	51.1	8.3	54.2
26 00	183	59.6	S12	23.3	67	32.8	13.7	S17	42.8	8.5	54.2
01	198	59.7		24.2	82	05.5	13.8	17	34.3	8.5	54.2
02	213	59.7		25.0	96	38.3	13.8	17	25.8	8.6	54.2
03	228	59.8	. .	25.9	111	11.1	13.8	17	17.2	8.7	54.2
04	243	59.9		26.7	125	43.9	14.0	17	08.5	8.7	54.2
05	258	59.9		27.6	140	16.9	13.9	16	59.8	8.8	54.2
06	274	00.0	S12	28.4	154	49.8	14.1	S16	51.0	8.9	54.2
07	289	00.1		29.3	169	22.9	14.0	16	42.1	9.0	54.2
V 08	304	00.1		30.1	183	55.9	14.1	16	33.1	9.0	54.2
I 09	319	00.2	. .	31.0	198	29.0	14.2	16	24.1	9.1	54.2
E 10	334	00.2		31.9	213	02.2	14.2	16	15.0	9.1	54.2
R 11	349	00.3		32.7	227	35.4	14.2	16	05.9	9.2	54.2
N 12	4	00.4	S12	33.6	242	08.6	14.3	S15	56.7	9.3	54.2
E 13	19	00.4		34.4	256	41.9	14.4	15	47.4	9.3	54.2
S 14	34	00.5		35.3	271	15.3	14.4	15	38.1	9.5	54.2
15	49	00.6	. .	36.1	285	48.7	14.4	15	28.6	9.4	54.2
16	64	00.6		37.0	300	22.1	14.5	15	19.2	9.6	54.2
17	79	00.7		37.8	314	55.6	14.5	15	09.6	9.6	54.2
18	94	00.7	S12	38.7	329	29.1	14.5	S15	00.0	9.6	54.2
19	109	00.8		39.5	344	02.6	14.6	14	50.4	9.8	54.2
20	124	00.9		40.3	358	36.2	14.7	14	40.6	9.7	54.2
21	139	00.9	. .	41.2	13	09.9	14.7	14	30.9	9.9	54.2
22	154	01.0		42.0	27	43.6	14.7	14	21.0	9.9	54.2
23	169	01.0		42.9	42	17.3	14.7	14	11.1	9.9	54.2
27 00	184	01.1	S12	43.7	56	51.0	14.8	S14	01.2	10.1	54.2
01	199	01.2		44.6	71	24.8	14.9	13	51.1	10.0	54.2
02	214	01.2		45.4	85	58.7	14.8	13	41.1	10.2	54.2
03	229	01.3	. .	46.3	100	32.5	14.9	13	30.9	10.1	54.2
04	244	01.3		47.1	115	06.4	15.0	13	20.8	10.3	54.2
05	259	01.4		48.0	129	40.4	15.0	13	10.5	10.3	54.2
06	274	01.5	S12	48.8	144	14.4	15.0	S13	00.2	10.3	54.2
07	289	01.5		49.7	158	48.4	15.0	12	49.9	10.4	54.2
S 08	304	01.6		50.5	173	22.4	15.1	12	39.5	10.5	54.2
A 09	319	01.6	. .	51.3	187	56.5	15.1	12	29.0	10.5	54.2
10	334	01.7		52.2	202	30.6	15.2	12	18.5	10.6	54.2
B 11	349	01.7		53.0	217	04.8	15.1	12	07.9	10.6	54.2
A 12	4	01.8	S12	53.9	231	38.9	15.2	S11	57.3	10.6	54.2
13	19	01.8		54.7	246	13.1	15.3	11	46.7	10.7	54.2
D 14	34	01.9		55.6	260	47.4	15.2	11	36.0	10.8	54.2
O 15	49	02.0	. .	56.4	275	21.6	15.3	11	25.2	10.8	54.2
16	64	02.0		57.2	289	55.9	15.4	11	14.4	10.8	54.2
17	79	02.1		58.1	304	30.3	15.3	11	03.6	10.9	54.2
18	94	02.1	S12	58.9	319	04.6	15.4	S10	52.7	11.0	54.2
19	109	02.2	12	59.8	333	39.0	15.4	10	41.7	11.0	54.2
20	124	02.2	13	00.6	348	13.4	15.4	10	30.7	11.0	54.2
21	139	02.3	. .	01.4	2	47.8	15.4	10	19.7	11.1	54.2
22	154	02.3		02.3	17	22.2	15.5	10	08.6	11.1	54.2
23	169	02.4		03.1	31	56.7	15.5	S 9	57.5	11.2	54.2
	SD	16.1	d	0.9	SD		14.8		14.8		14.8

Lat.	Crepúsculo Náutico	Crepúsculo Civil	Orto Sol	Orto Luna 25	Orto Luna 26	Orto Luna 27	Orto Luna 28
°	h m	h m	h m	h m	h m	h m	h m
N 72	05 42	07 02	08 22	▬	17 47	17 11	16 46
N 70	05 41	06 53	08 02	17 50	17 14	16 53	16 37
68	05 39	06 45	07 46	17 06	16 50	16 39	16 30
66	05 38	06 38	07 34	16 36	16 32	16 27	16 23
64	05 37	06 32	07 23	16 13	16 16	16 17	16 18
62	05 35	06 27	07 15	15 55	16 04	16 09	16 13
60	05 34	06 23	07 07	15 40	15 53	16 02	16 09
N 58	05 33	06 19	07 00	15 28	15 43	15 55	16 05
56	05 32	06 15	06 54	15 17	15 35	15 49	16 02
54	05 31	06 12	06 49	15 07	15 27	15 44	15 59
52	05 30	06 09	06 44	14 58	15 21	15 40	15 56
50	05 28	06 06	06 40	14 50	15 15	15 35	15 54
45	05 26	06 00	06 30	14 34	15 02	15 26	15 48
N 40	05 23	05 55	06 22	14 20	14 51	15 18	15 44
35	05 20	05 50	06 15	14 08	14 42	15 12	15 40
30	05 17	05 45	06 09	13 58	14 33	15 06	15 36
20	05 10	05 36	05 59	13 40	14 19	14 56	15 30
N 10	05 03	05 28	05 49	13 25	14 07	14 47	15 25
0	04 55	05 19	05 41	13 10	13 55	14 38	15 20
S 10	04 45	05 10	05 32	12 56	13 44	14 30	15 15
20	04 33	04 59	05 22	12 40	13 31	14 21	15 10
30	04 16	04 46	05 11	12 22	13 17	14 10	15 04
35	04 06	04 38	05 04	12 12	13 08	14 04	15 00
40	03 54	04 28	04 57	12 00	12 59	13 58	14 56
45	03 38	04 17	04 48	11 46	12 48	13 50	14 52
S 50	03 18	04 02	04 37	11 28	12 34	13 40	14 46
52	03 08	03 55	04 33	11 20	12 28	13 35	14 43
54	02 57	03 48	04 27	11 11	12 20	13 30	14 41
56	02 44	03 39	04 21	11 01	12 13	13 25	14 38
58	02 28	03 29	04 14	10 49	12 04	13 19	14 34
S 60	02 09	03 18	04 07	10 35	11 53	13 12	14 30

Lat.	Ocaso Sol	Crepúsculo Civil	Crepúsculo Náutico	Ocaso Luna 25	Ocaso Luna 26	Ocaso Luna 27	Ocaso Luna 28
°	h m	h m	h m	h m	h m	h m	h m
N 72	15 05	16 24	17 44	▬	22 43	24 48	00 48
N 70	15 25	16 34	17 46	21 06	23 14	25 04	01 04
68	15 40	16 42	17 47	21 50	23 37	25 17	01 17
66	15 53	16 48	17 49	22 19	23 55	25 27	01 27
64	16 03	16 54	17 50	22 40	24 09	00 09	01 36
62	16 12	16 59	17 51	22 58	24 21	00 21	01 43
60	16 20	17 04	17 53	23 12	24 31	00 31	01 49
N 58	16 27	17 08	17 54	23 24	24 40	00 40	01 55
56	16 33	17 12	17 55	23 35	24 47	00 47	02 00
54	16 38	17 15	17 56	23 44	24 54	00 54	02 04
52	16 43	17 18	17 57	23 52	25 00	01 00	02 08
50	16 48	17 21	17 59	24 00	00 00	01 06	02 12
45	16 57	17 27	18 02	24 15	00 15	01 17	02 19
N 40	17 05	17 33	18 05	24 28	00 28	01 27	02 26
35	17 12	17 38	18 08	24 39	00 39	01 35	02 31
30	17 18	17 43	18 11	24 49	00 49	01 43	02 36
20	17 29	17 51	18 17	00 14	01 05	01 55	02 45
N 10	17 38	18 00	18 25	00 30	01 19	02 06	02 52
0	17 47	18 09	18 33	00 46	01 32	02 16	02 59
S 10	17 56	18 18	18 43	01 02	01 45	02 26	03 05
20	18 06	18 29	18 56	01 19	01 59	02 37	03 12
30	18 18	18 43	19 12	01 38	02 15	02 49	03 20
35	18 24	18 51	19 23	01 49	02 24	02 56	03 25
40	18 32	19 01	19 35	02 01	02 35	03 04	03 30
45	18 41	19 12	19 51	02 16	02 47	03 13	03 36
S 50	18 52	19 27	20 11	02 35	03 02	03 24	03 44
52	18 57	19 34	20 21	02 43	03 09	03 29	03 47
54	19 02	19 42	20 33	02 53	03 16	03 35	03 50
56	19 08	19 51	20 46	03 04	03 25	03 41	03 54
58	19 15	20 01	21 03	03 16	03 34	03 48	03 59
S 60	19 23	20 13	21 23	03 30	03 45	03 56	04 04

Día	SOL E.T. (+) 00h	SOL E.T. (+) 12h	Pas. Mer.	LUNA Pas. Mer. Sup.	LUNA Pas. Mer. Inf.	LUNA Edad	LUNA Fase
d	m s	m s	h m	h m	h m	d	%
25	15 51	15 55	11 44	19 21	06 58	09	63
26	15 58	16 01	11 44	20 06	07 44	10	72
27	16 04	16 07	11 44	20 48	08 27	11	80

T.U.	ARIES	VENUS −3.9		MARTE +0.0		JUPITER −2.4		SATURNO −0.2	
d h	A.H.G.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.
	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
28 00	36 24.3	201 28.7	S 4 42.0	93 31.1	S22 15.5	289 27.2	N22 23.4	323 23.9	N20 37.9
01	51 26.7	216 28.3	43.2	108 31.8	15.1	304 29.6	23.4	338 26.5	37.9
02	66 29.2	231 27.9	44.4	123 32.5	14.6	319 32.0	23.4	353 29.1	37.9
03	81 31.6	246 27.5	45.6	138 33.1	14.2	334 34.4	23.4	8 31.7	37.9
04	96 34.1	261 27.1	46.8	153 33.8	13.8	349 36.9	23.4	23 34.3	37.8
05	111 36.6	276 26.6	48.0	168 34.5	13.3	4 39.3	23.4	38 36.9	37.8
06	126 39.0	291 26.2	S 4 49.2	183 35.2	S22 12.9	19 41.7	N22 23.4	53 39.5	N20 37.8
07	141 41.5	306 25.8	50.4	198 35.8	12.5	34 44.1	23.4	68 42.1	37.8
D 08	156 44.0	321 25.4	51.6	213 36.5	12.0	49 46.5	23.4	83 44.7	37.8
O 09	171 46.4	336 25.0	52.8	228 37.2	11.6	64 48.9	23.4	98 47.3	37.7
M 10	186 48.9	351 24.5	54.0	243 37.9	11.2	79 51.3	23.4	113 49.9	37.7
I 11	201 51.4	6 24.1	55.2	258 38.5	10.7	94 53.8	23.4	128 52.5	37.7
N 12	216 53.8	21 23.7	S 4 56.5	273 39.2	S22 10.3	109 56.2	N22 23.4	143 55.1	N20 37.7
G 13	231 56.3	36 23.3	57.7	288 39.9	09.9	124 58.6	23.4	158 57.7	37.7
O 14	246 58.8	51 22.9	4 58.9	303 40.6	09.4	140 01.0	23.4	174 00.3	37.7
15	262 01.2	66 22.5	5 00.1	318 41.2	09.0	155 03.4	23.4	189 02.9	37.6
16	277 03.7	81 22.0	01.3	333 41.9	08.5	170 05.9	23.4	204 05.5	37.6
17	292 06.1	96 21.6	02.5	348 42.6	08.1	185 08.3	23.4	219 08.2	37.6
18	307 08.6	111 21.2	S 5 03.7	3 43.3	S22 07.7	200 10.7	N22 23.4	234 10.8	N20 37.6
19	322 11.1	126 20.8	04.9	18 43.9	07.2	215 13.1	23.4	249 13.4	37.6
20	337 13.5	141 20.3	06.1	33 44.6	06.8	230 15.5	23.4	264 16.0	37.5
21	352 16.0	156 19.9	07.3	48 45.3	06.4	245 18.0	23.4	279 18.6	37.5
22	7 18.5	171 19.5	08.5	63 46.0	05.9	260 20.4	23.4	294 21.2	37.5
23	22 20.9	186 19.1	09.7	78 46.6	05.5	275 22.8	23.4	309 23.8	37.5
29 00	37 23.4	201 18.7	S 5 10.9	93 47.3	S22 05.0	290 25.2	N22 23.4	324 26.4	N20 37.5
01	52 25.9	216 18.2	12.1	108 48.0	04.6	305 27.6	23.4	339 29.0	37.5
02	67 28.3	231 17.8	13.3	123 48.7	04.2	320 30.1	23.4	354 31.6	37.4
03	82 30.8	246 17.4	14.5	138 49.3	03.7	335 32.5	23.4	9 34.2	37.4
04	97 33.2	261 17.0	15.7	153 50.0	03.3	350 34.9	23.4	24 36.8	37.4
05	112 35.7	276 16.5	16.9	168 50.7	02.8	5 37.3	23.4	39 39.4	37.4
06	127 38.2	291 16.1	S 5 18.1	183 51.4	S22 02.4	20 39.8	N22 23.4	54 42.1	N20 37.4
07	142 40.6	306 15.7	19.4	198 52.0	02.0	35 42.2	23.4	69 44.7	37.3
08	157 43.1	321 15.3	20.6	213 52.7	01.5	50 44.6	23.4	84 47.3	37.3
L 09	172 45.6	336 14.9	21.8	228 53.4	01.1	65 47.0	23.4	99 49.9	37.3
U 10	187 48.0	351 14.4	23.0	243 54.1	00.6	80 49.5	23.4	114 52.5	37.3
11	202 50.5	6 14.0	24.2	258 54.7	22 00.2	95 51.9	23.4	129 55.1	37.3
N 12	217 53.0	21 13.6	S 5 25.4	273 55.4	S21 59.7	110 54.3	N22 23.4	144 57.7	N20 37.2
E 13	232 55.4	36 13.2	26.6	288 56.1	59.3	125 56.7	23.4	160 00.3	37.2
14	247 57.9	51 12.7	27.8	303 56.8	58.9	140 59.2	23.4	175 02.9	37.2
S 15	263 00.4	66 12.3	29.0	318 57.4	58.4	156 01.6	23.4	190 05.5	37.2
16	278 02.8	81 11.9	30.2	333 58.1	58.0	171 04.0	23.4	205 08.2	37.2
17	293 05.3	96 11.5	31.4	348 58.8	57.5	186 06.5	23.4	220 10.8	37.2
18	308 07.7	111 11.0	S 5 32.6	3 59.5	S21 57.1	201 08.9	N22 23.4	235 13.4	N20 37.1
19	323 10.2	126 10.6	33.8	19 00.1	56.6	216 11.3	23.4	250 16.0	37.1
20	338 12.7	141 10.2	35.0	34 00.8	56.2	231 13.7	23.4	265 18.6	37.1
21	353 15.1	156 09.8	36.2	49 01.5	55.7	246 16.2	23.4	280 21.2	37.1
22	8 17.6	171 09.3	37.4	64 02.2	55.3	261 18.6	23.4	295 23.8	37.1
23	23 20.1	186 08.9	38.6	79 02.8	54.9	276 21.0	23.4	310 26.4	37.0
30 00	38 22.5	201 08.5	S 5 39.8	94 03.5	S21 54.4	291 23.5	N22 23.4	325 29.0	N20 37.0
01	53 25.0	216 08.0	41.0	109 04.2	54.0	306 25.9	23.4	340 31.7	37.0
02	68 27.5	231 07.6	42.2	124 04.9	53.5	321 28.3	23.4	355 34.3	37.0
03	83 29.9	246 07.2	43.4	139 05.5	53.1	336 30.8	23.4	10 36.9	37.0
04	98 32.4	261 06.8	44.6	154 06.2	52.6	351 33.2	23.4	25 39.5	36.9
05	113 34.8	276 06.3	45.8	169 06.9	52.2	6 35.6	23.4	40 42.1	36.9
06	128 37.3	291 05.9	S 5 47.0	184 07.6	S21 51.7	21 38.1	N22 23.4	55 44.7	N20 36.9
07	143 39.8	306 05.5	48.2	199 08.2	51.3	36 40.5	23.4	70 47.3	36.9
M 08	158 42.2	321 05.0	49.4	214 08.9	50.8	51 42.9	23.4	85 49.9	36.9
A 09	173 44.7	336 04.6	50.6	229 09.6	50.4	66 45.4	23.4	100 52.6	36.9
R 10	188 47.2	351 04.2	51.8	244 10.3	49.9	81 47.8	23.4	115 55.2	36.8
11	203 49.6	6 03.8	53.0	259 10.9	49.5	96 50.2	23.4	130 57.8	36.8
T 12	218 52.1	21 03.3	S 5 54.2	274 11.6	S21 49.0	111 52.7	N22 23.4	146 00.4	N20 36.8
13	233 54.6	36 02.9	55.4	289 12.3	48.6	126 55.1	23.4	161 03.0	36.8
E 14	248 57.0	51 02.5	56.6	304 13.0	48.1	141 57.5	23.4	176 05.6	36.8
S 15	263 59.5	66 02.0	57.8	319 13.6	47.7	157 00.0	23.4	191 08.2	36.7
16	279 02.0	81 01.6	5 59.0	334 14.3	47.2	172 02.4	23.4	206 10.9	36.7
17	294 04.4	96 01.2	6 00.2	349 15.0	46.8	187 04.8	23.4	221 13.5	36.7
18	309 06.9	111 00.7	S 6 01.4	4 15.7	S21 46.3	202 07.3	N22 23.4	236 16.1	N20 36.7
19	324 09.3	126 00.3	02.6	19 16.3	45.9	217 09.7	23.4	251 18.7	36.7
20	339 11.8	140 59.9	03.8	34 17.0	45.4	232 12.2	23.4	266 21.3	36.6
21	354 14.3	155 59.4	05.0	49 17.7	44.9	247 14.6	23.4	281 23.9	36.6
22	9 16.7	170 59.0	06.2	64 18.4	44.5	262 17.0	23.4	296 26.5	36.6
23	24 19.2	185 58.6	07.4	79 19.0	44.0	277 19.5	23.4	311 29.2	36.6
	h m								
Pas. Mer.	21 26.9	v −0.4	d 1.2	v 0.7	d 0.4	v 2.4	d 0.0	v 2.6	d 0.0

ESTRELLAS

Nombre	A.H.S. ° ′	Dec. ° ′
Acamar	315 24.8	S40 17.8
Achernar	335 32.9	S57 13.8
Acrux	173 20.4	S63 06.2
Adhara	255 19.6	S28 58.2
Aldebaran	290 59.6	N16 30.8
Alioth	166 29.1	N55 57.1
Alkaid	153 06.5	N49 18.4
Al Na'ir	27 54.9	S46 57.4
Alnilam	275 55.5	S 1 11.9
Alphard	218 05.2	S 8 39.7
Alphecca	126 19.1	N26 42.7
Alpheratz	357 52.8	N29 06.1
Altair	62 17.3	N 8 52.5
Ankaa	353 24.3	S42 17.9
Antares	112 37.9	S26 26.1
Arcturus	146 04.4	N19 10.6
Atria	107 48.5	S69 01.9
Avior	234 21.8	S59 30.5
Bellatrix	278 41.6	N 6 21.1
Betelgeuse	271 11.0	N 7 24.5
Canopus	263 59.9	S52 41.5
Capella	280 47.7	N45 59.9
Deneb	49 37.8	N45 17.4
Denebola	182 43.2	N14 33.9
Diphda	349 04.8	S17 58.7
Dubhe	194 03.1	N61 44.4
Elnath	278 24.0	N28 36.5
Eltanin	90 50.7	N51 29.6
Enif	33 56.0	N 9 53.1
Fomalhaut	15 33.8	S29 36.9
Gacrux	172 11.8	S57 07.1
Gienah	176 02.1	S17 32.8
Hadar	149 01.8	S60 22.7
Hamal	328 10.8	N23 28.3
Kaus Aust.	83 56.2	S34 23.1
Kochab	137 20.6	N74 09.0
Markab	13 47.3	N15 13.0
Menkar	314 24.3	N 4 05.8
Menkent	148 18.9	S36 22.5
Miaplacidus	221 41.9	S69 43.0
Mirfak	308 53.1	N49 52.0
Nunki	76 09.8	S26 17.7
Peacock	53 33.6	S56 44.0
Pollux	243 38.8	N28 01.3
Procyon	245 09.2	N 5 13.4
Rasalhague	96 15.2	N12 33.7
Regulus	207 53.4	N11 57.6
Rigel	281 20.6	S 8 11.9
Rigil Kent.	140 05.2	S60 50.4
Sabik	102 23.3	S15 43.5
Schedar	349 50.6	N56 32.9
Shaula	96 34.7	S37 06.3
Sirius	258 41.7	S16 42.9
Spica	158 41.3	S11 10.0
Suhail	222 59.3	S43 26.0
Vega	80 45.4	N38 47.4
Zuben'ubi	137 16.0	S16 02.8

	A.H.S. ° ′	Pas. Mer h m
Venus	163 55.3	10 35
Marte	56 23.9	17 44
Júpiter	253 01.8	4 38
Saturno	287 03.0	2 22

T.U.	SOL				LUNA						
	A.H.G.		Dec.		A.H.G.	v	Dec.	d	P.H.		
d h	°	′	°	′	°	′	′	°	′	′	′
28 00	184	02.4	S13	04.0	46	31.2	15.5	S 9	46.3	11.2	54.2
01	199	02.5		04.8	61	05.7	15.6	9	35.1	11.2	54.3
02	214	02.5		05.6	75	40.3	15.5	9	23.9	11.3	54.3
03	229	02.6	. .	06.5	90	14.8	15.6	9	12.6	11.3	54.3
04	244	02.6		07.3	104	49.4	15.6	9	01.3	11.4	54.3
05	259	02.7		08.1	119	24.0	15.6	8	49.9	11.4	54.3
06	274	02.7	S13	09.0	133	58.6	15.6	S 8	38.5	11.5	54.3
07	289	02.8		09.8	148	33.2	15.7	8	27.0	11.4	54.3
08	304	02.8		10.7	163	07.9	15.6	8	15.6	11.6	54.3
09	319	02.9	. .	11.5	177	42.5	15.7	8	04.0	11.5	54.3
10	334	02.9		12.3	192	17.2	15.7	7	52.5	11.6	54.3
11	349	03.0		13.2	206	51.9	15.7	7	40.9	11.6	54.3
12	4	03.0	S13	14.0	221	26.6	15.7	S 7	29.3	11.7	54.3
13	19	03.1		14.8	236	01.3	15.7	7	17.6	11.7	54.4
14	34	03.1		15.7	250	36.0	15.8	7	05.9	11.7	54.4
15	49	03.2	. .	16.5	265	10.8	15.7	6	54.2	11.8	54.4
16	64	03.2		17.3	279	45.5	15.8	6	42.4	11.8	54.4
17	79	03.3		18.2	294	20.3	15.8	6	30.6	11.8	54.4
18	94	03.3	S13	19.0	308	55.1	15.7	S 6	18.8	11.9	54.4
19	109	03.4		19.8	323	29.8	15.8	6	06.9	11.8	54.4
20	124	03.4		20.7	338	04.6	15.8	5	55.1	12.0	54.4
21	139	03.4	. .	21.5	352	39.4	15.8	5	43.1	11.9	54.4
22	154	03.5		22.3	7	14.2	15.8	5	31.2	12.0	54.5
23	169	03.5		23.1	21	49.0	15.8	5	19.2	12.0	54.5
29 00	184	03.6	S13	24.0	36	23.8	15.8	S 5	07.2	12.0	54.5
01	199	03.6		24.8	50	58.6	15.8	4	55.2	12.0	54.5
02	214	03.7		25.6	65	33.4	15.8	4	43.2	12.1	54.5
03	229	03.7	. .	26.5	80	08.2	15.8	4	31.1	12.1	54.5
04	244	03.8		27.3	94	43.0	15.8	4	19.0	12.1	54.5
05	259	03.8		28.1	109	17.8	15.8	4	06.9	12.2	54.5
06	274	03.8	S13	28.9	123	52.6	15.8	S 3	54.7	12.1	54.6
07	289	03.9		29.8	138	27.4	15.9	3	42.6	12.2	54.6
08	304	03.9		30.6	153	02.3	15.8	3	30.4	12.2	54.6
09	319	04.0	. .	31.4	167	37.1	15.7	3	18.2	12.2	54.6
10	334	04.0		32.3	182	11.8	15.8	3	06.0	12.3	54.6
11	349	04.0		33.1	196	46.6	15.8	2	53.7	12.3	54.6
12	4	04.1	S13	33.9	211	21.4	15.8	S 2	41.4	12.2	54.6
13	19	04.1		34.7	225	56.2	15.8	2	29.2	12.3	54.6
14	34	04.2		35.6	240	31.0	15.7	2	16.9	12.4	54.7
15	49	04.2	. .	36.4	255	05.7	15.8	2	04.5	12.3	54.7
16	64	04.2		37.2	269	40.5	15.7	1	52.2	12.3	54.7
17	79	04.3		38.0	284	15.2	15.7	1	39.9	12.4	54.7
18	94	04.3	S13	38.8	298	49.9	15.8	S 1	27.5	12.4	54.7
19	109	04.4		39.7	313	24.7	15.7	1	15.1	12.4	54.7
20	124	04.4		40.5	327	59.4	15.7	1	02.7	12.4	54.8
21	139	04.4	. .	41.3	342	34.1	15.6	0	50.3	12.4	54.8
22	154	04.5		42.1	357	08.7	15.7	0	37.9	12.4	54.8
23	169	04.5		43.0	11	43.4	15.6	0	25.5	12.5	54.8
30 00	184	04.5	S13	43.8	26	18.0	15.7	S 0	13.0	12.4	54.8
01	199	04.6		44.6	40	52.7	15.6	S 0	00.6	12.4	54.8
02	214	04.6		45.4	55	27.3	15.6	N 0	11.8	12.5	54.8
03	229	04.6	. .	46.2	70	01.9	15.5	0	24.3	12.5	54.9
04	244	04.7		47.1	84	36.4	15.6	0	36.8	12.4	54.9
05	259	04.7		47.9	99	11.0	15.5	0	49.2	12.5	54.9
06	274	04.7	S13	48.7	113	45.5	15.5	N 1	01.7	12.5	54.9
07	289	04.8		49.5	128	20.0	15.5	1	14.2	12.5	54.9
08	304	04.8		50.3	142	54.5	15.5	1	26.7	12.5	54.9
09	319	04.8	. .	51.1	157	29.0	15.4	1	39.2	12.5	55.0
10	334	04.9		52.0	172	03.4	15.4	1	51.7	12.5	55.0
11	349	04.9		52.8	186	37.8	15.4	2	04.2	12.5	55.0
12	4	04.9	S13	53.6	201	12.2	15.4	N 2	16.7	12.5	55.0
13	19	05.0		54.4	215	46.6	15.3	2	29.2	12.4	55.0
14	34	05.0		55.2	230	20.9	15.3	2	41.6	12.5	55.0
15	49	05.0	. .	56.0	244	55.2	15.3	2	54.1	12.5	55.1
16	64	05.1		56.9	259	29.5	15.2	3	06.6	12.5	55.1
17	79	05.1		57.7	274	03.7	15.2	3	19.1	12.5	55.1
18	94	05.1	S13	58.5	288	37.9	15.2	N 3	31.6	12.5	55.1
19	109	05.2	13	59.3	303	12.1	15.1	3	44.1	12.4	55.1
20	124	05.2	14	00.1	317	46.2	15.2	3	56.5	12.5	55.2
21	139	05.2	. .	00.9	332	20.4	15.0	4	09.0	12.4	55.2
22	154	05.2		01.7	346	54.4	15.1	4	21.4	12.5	55.2
23	169	05.3		02.5	1	28.5	15.0	N 4	33.9	12.4	55.2
	SD	16.1	d	0.8	SD		14.8		14.9		15.0

DOMINGO — LUNES — MARTES

Lat.	Crepúsculo Náutico	Crepúsculo Civil	Orto Sol	Orto Luna 28	Orto Luna 29	Orto Luna 30	Orto Luna 31
°	h m	h m	h m	h m	h m	h m	h m
N 72	05 54	07 16	08 39	16 46	16 25	16 05	15 43
N 70	05 51	07 05	08 16	16 37	16 23	16 09	15 54
68	05 49	06 55	07 59	16 30	16 21	16 12	16 03
66	05 47	06 48	07 44	16 23	16 19	16 15	16 11
64	05 45	06 41	07 33	16 18	16 18	16 17	16 18
62	05 43	06 35	07 23	16 13	16 16	16 20	16 23
60	05 41	06 30	07 15	16 09	16 15	16 21	16 28
N 58	05 39	06 25	07 07	16 05	16 14	16 23	16 33
56	05 38	06 21	07 01	16 02	16 13	16 24	16 37
54	05 36	06 18	06 55	15 59	16 12	16 26	16 40
52	05 34	06 14	06 49	15 56	16 12	16 27	16 43
50	05 33	06 11	06 45	15 54	16 11	16 28	16 46
45	05 29	06 04	06 34	15 48	16 09	16 31	16 53
N 40	05 26	05 58	06 26	15 44	16 08	16 33	16 58
35	05 22	05 52	06 18	15 40	16 07	16 34	17 03
30	05 19	05 47	06 12	15 36	16 06	16 36	17 07
20	05 11	05 38	06 00	15 30	16 05	16 39	17 14
N 10	05 03	05 28	05 50	15 25	16 03	16 41	17 21
0	04 54	05 19	05 40	15 20	16 02	16 44	17 27
S 10	04 44	05 09	05 31	15 15	16 00	16 46	17 33
20	04 30	04 57	05 20	15 10	15 59	16 49	17 40
30	04 13	04 43	05 08	15 04	15 57	16 52	17 47
35	04 02	04 34	05 01	15 00	15 56	16 53	17 52
40	03 49	04 24	04 53	14 56	15 55	16 55	17 57
45	03 33	04 12	04 43	14 52	15 54	16 58	18 02
S 50	03 11	03 56	04 32	14 46	15 53	17 00	18 09
52	03 01	03 49	04 27	14 43	15 52	17 02	18 13
54	02 48	03 41	04 21	14 41	15 51	17 03	18 16
56	02 34	03 31	04 14	14 38	15 50	17 04	18 20
58	02 17	03 20	04 07	14 34	15 50	17 06	18 25
S 60	01 55	03 08	03 58	14 30	15 49	17 08	18 30

MARTES

Lat.	Ocaso Sol	Crepúsculo Civil	Crepúsculo Náutico	Ocaso Luna 28	Ocaso Luna 29	Ocaso Luna 30	Ocaso Luna 31
°	h m	h m	h m	h m	h m	h m	h m
N 72	14 47	16 10	17 31	00 48	02 41	04 30	06 22
N 70	15 10	16 21	17 34	01 04	02 47	04 29	06 13
68	15 28	16 31	17 37	01 17	02 53	04 28	06 06
66	15 42	16 39	17 39	01 27	02 57	04 28	06 00
64	15 54	16 45	17 42	01 36	03 01	04 27	05 55
62	16 03	16 51	17 44	01 43	03 05	04 27	05 51
60	16 12	16 56	17 45	01 49	03 08	04 26	05 47
N 58	16 19	17 01	17 47	01 55	03 10	04 26	05 43
56	16 26	17 05	17 49	02 00	03 12	04 26	05 40
54	16 32	17 09	17 51	02 04	03 15	04 25	05 38
52	16 37	17 12	17 52	02 08	03 16	04 25	05 35
50	16 42	17 16	17 54	02 12	03 18	04 25	05 33
45	16 53	17 23	17 57	02 19	03 22	04 24	05 29
N 40	17 01	17 29	18 01	02 26	03 25	04 24	05 25
35	17 09	17 35	18 05	02 31	03 27	04 24	05 21
30	17 16	17 40	18 08	02 36	03 30	04 23	05 18
20	17 27	17 50	18 16	02 45	03 34	04 23	05 13
N 10	17 37	17 59	18 24	02 52	03 37	04 22	05 08
0	17 47	18 08	18 33	02 59	03 40	04 22	05 04
S 10	17 57	18 19	18 44	03 05	03 43	04 21	05 00
20	18 08	18 31	18 57	03 12	03 47	04 21	04 55
30	18 20	18 45	19 15	03 20	03 50	04 20	04 50
35	18 27	18 54	19 26	03 25	03 53	04 20	04 47
40	18 35	19 04	19 39	03 30	03 55	04 19	04 44
45	18 45	19 17	19 56	03 36	03 58	04 19	04 40
S 50	18 57	19 33	20 18	03 44	04 01	04 18	04 36
52	19 02	19 40	20 29	03 47	04 03	04 18	04 34
54	19 08	19 48	20 41	03 50	04 04	04 18	04 31
56	19 15	19 58	20 56	03 54	04 06	04 17	04 29
58	19 22	20 09	21 14	03 59	04 08	04 17	04 26
S 60	19 31	20 22	21 37	04 04	04 10	04 17	04 23

Día	SOL E.T. (+) 00h	SOL E.T. (+) 12h	SOL Pas. Mer.	LUNA Pas. Sup.	LUNA Mer. Inf.	LUNA Edad	LUNA Fase
d	m s	m s	h m	h m	h m	d	%
28	16 10	16 12	11 44	21 30	09 09	12	87
29	16 14	16 16	11 44	22 12	09 51	13	93
30	16 18	16 20	11 44	22 54	10 33	14	97

T.U.	ARIES	VENUS −3.9		MARTE +0.1		JUPITER −2.4		SATURNO −0.3	
d h	A.H.G.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.
	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
31 00	39 21.7	200 58.2	S 6 08.6	94 19.7	S21 43.6	292 21.9	N22 23.4	326 31.8	N20 36.6
01	54 24.1	215 57.7	09.8	109 20.4	43.1	307 24.4	23.4	341 34.4	36.6
02	69 26.6	230 57.3	11.0	124 21.1	42.7	322 26.8	23.4	356 37.0	36.5
03	84 29.1	245 56.9	12.1	139 21.7	42.2	337 29.2	23.4	11 39.6	36.5
04	99 31.5	260 56.4	13.3	154 22.4	41.8	352 31.7	23.4	26 42.2	36.5
05	114 34.0	275 56.0	14.5	169 23.1	41.3	7 34.1	23.4	41 44.9	36.5
06	129 36.4	290 55.5	S 6 15.7	184 23.7	S21 40.8	22 36.6	N22 23.4	56 47.5	N20 36.5
07	144 38.9	305 55.1	16.9	199 24.4	40.4	37 39.0	23.4	71 50.1	36.4
08	159 41.4	320 54.7	18.1	214 25.1	39.9	52 41.5	23.4	86 52.7	36.4
09	174 43.8	335 54.2	19.3	229 25.8	39.5	67 43.9	23.4	101 55.3	36.4
10	189 46.3	350 53.8	20.5	244 26.4	39.0	82 46.3	23.4	116 57.9	36.4
11	204 48.8	5 53.4	21.7	259 27.1	38.6	97 48.8	23.4	132 00.6	36.4
12	219 51.2	20 52.9	S 6 22.9	274 27.8	S21 38.1	112 51.2	N22 23.4	147 03.2	N20 36.3
13	234 53.7	35 52.5	24.1	289 28.5	37.6	127 53.7	23.5	162 05.8	36.3
14	249 56.2	50 52.1	25.3	304 29.1	37.2	142 56.1	23.5	177 08.4	36.3
15	264 58.6	65 51.6	26.5	319 29.8	36.7	157 58.6	23.5	192 11.0	36.3
16	280 01.1	80 51.2	27.7	334 30.5	36.3	173 01.0	23.5	207 13.6	36.3
17	295 03.6	95 50.8	28.9	349 31.2	35.8	188 03.5	23.5	222 16.3	36.2
18	310 06.0	110 50.3	S 6 30.1	4 31.8	S21 35.3	203 05.9	N22 23.5	237 18.9	N20 36.2
19	325 08.5	125 49.9	31.3	19 32.5	34.9	218 08.3	23.5	252 21.5	36.2
20	340 10.9	140 49.4	32.4	34 33.2	34.4	233 10.8	23.5	267 24.1	36.2
21	355 13.4	155 49.0	33.6	49 33.9	34.0	248 13.2	23.5	282 26.7	36.2
22	10 15.9	170 48.6	34.8	64 34.5	33.5	263 15.7	23.5	297 29.4	36.1
23	25 18.3	185 48.1	36.0	79 35.2	33.0	278 18.1	23.5	312 32.0	36.1
1 00	40 20.8	200 47.7	S 6 37.2	94 35.9	S21 32.6	293 20.6	N22 23.5	327 34.6	N20 36.1
01	55 23.3	215 47.2	38.4	109 36.6	32.1	308 23.0	23.5	342 37.2	36.1
02	70 25.7	230 46.8	39.6	124 37.2	31.6	323 25.5	23.5	357 39.8	36.1
03	85 28.2	245 46.4	40.8	139 37.9	31.2	338 27.9	23.5	12 42.5	36.0
04	100 30.7	260 45.9	42.0	154 38.6	30.7	353 30.4	23.5	27 45.1	36.0
05	115 33.1	275 45.5	43.2	169 39.3	30.3	8 32.8	23.5	42 47.7	36.0
06	130 35.6	290 45.0	S 6 44.4	184 39.9	S21 29.8	23 35.3	N22 23.5	57 50.3	N20 36.0
07	145 38.1	305 44.6	45.5	199 40.6	29.3	38 37.7	23.5	72 52.9	36.0
08	160 40.5	320 44.2	46.7	214 41.3	28.9	53 40.2	23.5	87 55.6	36.0
09	175 43.0	335 43.7	47.9	229 42.0	28.4	68 42.6	23.5	102 58.2	35.9
10	190 45.4	350 43.3	49.1	244 42.6	27.9	83 45.1	23.5	118 00.8	35.9
11	205 47.9	5 42.8	50.3	259 43.3	27.5	98 47.5	23.5	133 03.4	35.9
12	220 50.4	20 42.4	S 6 51.5	274 44.0	S21 27.0	113 50.0	N22 23.5	148 06.0	N20 35.9
13	235 52.8	35 42.0	52.7	289 44.7	26.5	128 52.5	23.5	163 08.7	35.9
14	250 55.3	50 41.5	53.9	304 45.3	26.1	143 54.9	23.5	178 11.3	35.8
15	265 57.8	65 41.1	55.1	319 46.0	25.6	158 57.4	23.5	193 13.9	35.8
16	281 00.2	80 40.6	56.2	334 46.7	25.1	173 59.8	23.5	208 16.5	35.8
17	296 02.7	95 40.2	57.4	349 47.3	24.7	189 02.3	23.5	223 19.1	35.8
18	311 05.2	110 39.7	S 6 58.6	4 48.0	S21 24.2	204 04.7	N22 23.5	238 21.8	N20 35.8
19	326 07.6	125 39.3	6 59.8	19 48.7	23.7	219 07.2	23.5	253 24.4	35.7
20	341 10.1	140 38.9	7 01.0	34 49.4	23.3	234 09.6	23.5	268 27.0	35.7
21	356 12.5	155 38.4	02.2	49 50.0	22.8	249 12.1	23.5	283 29.6	35.7
22	11 15.0	170 38.0	03.4	64 50.7	22.3	264 14.6	23.5	298 32.3	35.7
23	26 17.5	185 37.5	04.5	79 51.4	21.8	279 17.0	23.6	313 34.9	35.7
2 00	41 19.9	200 37.1	S 7 05.7	94 52.1	S21 21.4	294 19.5	N22 23.6	328 37.5	N20 35.6
01	56 22.4	215 36.6	06.9	109 52.7	20.9	309 21.9	23.6	343 40.1	35.6
02	71 24.9	230 36.2	08.1	124 53.4	20.4	324 24.4	23.6	358 42.7	35.6
03	86 27.3	245 35.7	09.3	139 54.1	20.0	339 26.8	23.6	13 45.4	35.6
04	101 29.8	260 35.3	10.5	154 54.8	19.5	354 29.3	23.6	28 48.0	35.6
05	116 32.3	275 34.8	11.7	169 55.4	19.0	9 31.8	23.6	43 50.6	35.5
06	131 34.7	290 34.4	S 7 12.8	184 56.1	S21 18.5	24 34.2	N22 23.6	58 53.2	N20 35.5
07	146 37.2	305 33.9	14.0	199 56.8	18.1	39 36.7	23.6	73 55.9	35.5
08	161 39.7	320 33.5	15.2	214 57.5	17.6	54 39.1	23.6	88 58.5	35.5
09	176 42.1	335 33.0	16.4	229 58.1	17.1	69 41.6	23.6	104 01.1	35.5
10	191 44.6	350 32.6	17.6	244 58.8	16.7	84 44.1	23.6	119 03.7	35.4
11	206 47.0	5 32.2	18.8	259 59.5	16.2	99 46.5	23.6	134 06.4	35.4
12	221 49.5	20 31.7	S 7 19.9	275 00.2	S21 15.7	114 49.0	N22 23.6	149 09.0	N20 35.4
13	236 52.0	35 31.3	21.1	290 00.8	15.2	129 51.5	23.6	164 11.6	35.4
14	251 54.4	50 30.8	22.3	305 01.5	14.8	144 53.9	23.6	179 14.2	35.4
15	266 56.9	65 30.4	23.5	320 02.2	14.3	159 56.4	23.6	194 16.9	35.3
16	281 59.4	80 29.9	24.7	335 02.9	13.8	174 58.8	23.6	209 19.5	35.3
17	297 01.8	95 29.5	25.9	350 03.5	13.3	190 01.3	23.6	224 22.1	35.3
18	312 04.3	110 29.0	S 7 27.0	5 04.2	S21 12.9	205 03.8	N22 23.6	239 24.7	N20 35.3
19	327 06.8	125 28.6	28.2	20 04.9	12.4	220 06.2	23.6	254 27.4	35.3
20	342 09.2	140 28.1	29.4	35 05.6	11.9	235 08.7	23.6	269 30.0	35.2
21	357 11.7	155 27.7	30.6	50 06.2	11.4	250 11.2	23.6	284 32.6	35.2
22	12 14.2	170 27.2	31.8	65 06.9	10.9	265 13.6	23.6	299 35.2	35.2
23	27 16.6	185 26.7	32.9	80 07.6	10.5	280 16.1	23.6	314 37.9	35.2
	h m								
Pas. Mer.	21 15.1	v −0.4	d 1.2	v 0.7	d 0.5	v 2.5	d 0.0	v 2.6	d 0.0

ESTRELLAS

Nombre	A.H.S.	Dec.
	° ′	° ′
Acamar	315 24.8	S40 17.8
Achernar	335 32.9	S57 13.8
Acrux	173 20.3	S63 06.2
Adhara	255 19.6	S28 58.2
Aldebaran	290 59.6	N16 30.8
Alioth	166 29.1	N55 57.0
Alkaid	153 06.5	N49 18.4
Al Na'ir	27 55.0	S46 57.4
Alnilam	275 55.4	S 1 12.0
Alphard	218 05.2	S 8 39.7
Alphecca	126 19.1	N26 42.7
Alpheratz	357 52.8	N29 06.1
Altair	62 17.3	N 8 52.5
Ankaa	353 24.3	S42 17.9
Antares	112 37.9	S26 26.1
Arcturus	146 04.4	N19 10.6
Atria	107 48.5	S69 01.9
Avior	234 21.8	S59 30.5
Bellatrix	278 41.6	N 6 21.1
Betelgeuse	271 11.0	N 7 24.5
Canopus	263 59.9	S52 41.5
Capella	280 47.7	N45 59.9
Deneb	49 37.8	N45 17.4
Denebola	182 43.2	N14 33.9
Diphda	349 04.8	S17 58.7
Dubhe	194 03.1	N61 44.4
Elnath	278 23.9	N28 36.5
Eltanin	90 50.8	N51 29.6
Enif	33 56.1	N 9 53.1
Fomalhaut	15 33.8	S29 36.9
Gacrux	172 11.8	S57 07.1
Gienah	176 02.1	S17 32.8
Hadar	149 01.7	S60 22.7
Hamal	328 10.8	N23 28.3
Kaus Aust.	83 56.2	S34 23.1
Kochab	137 20.6	N74 09.0
Markab	13 47.3	N15 13.0
Menkar	314 24.3	N 4 05.8
Menkent	148 18.9	S36 22.5
Miaplacidus	221 41.9	S69 43.0
Mirfak	308 53.1	N49 52.0
Nunki	76 09.8	S26 17.7
Peacock	53 33.6	S56 44.0
Pollux	243 38.8	N28 01.3
Procyon	245 09.2	N 5 13.3
Rasalhague	96 15.2	N12 33.7
Regulus	207 53.4	N11 57.6
Rigel	281 20.6	S 8 11.9
Rigil Kent.	140 05.2	S60 50.4
Sabik	102 23.4	S15 43.5
Schedar	349 50.6	N56 32.9
Shaula	96 34.7	S37 06.3
Sirius	258 41.7	S16 42.9
Spica	158 41.3	S11 10.0
Suhail	222 59.3	S43 26.0
Vega	80 45.4	N38 47.4
Zuben'ubi	137 15.9	S16 02.8

	A.H.S.	Pas. Mer.
	° ′	h m
Venus	160 26.9	10 37
Marte	54 15.1	17 41
Júpiter	252 59.8	4 26
Saturno	287 13.8	2 09

T.U.	SOL				LUNA						
	A.H.G.		Dec.		A.H.G.	v		Dec.	d		P.H.
d h	°	′	°	′	°	′	′	°	′	′	′
31 00	184	05.3	S14	03.4	16	02.5	14.9	N 4	46.3	12.4	55.2
01	199	05.3		04.2	30	36.4	15.0	4	58.7	12.5	55.2
02	214	05.4		05.0	45	10.4	14.9	5	11.2	12.4	55.3
03	229	05.4	. .	05.8	59	44.3	14.8	5	23.6	12.3	55.3
04	244	05.4		06.6	74	18.1	14.8	5	35.9	12.4	55.3
05	259	05.4		07.4	88	51.9	14.8	5	48.3	12.4	55.3
06	274	05.5	S14	08.2	103	25.7	14.7	N 6	00.7	12.3	55.3
M 07	289	05.5		09.0	117	59.4	14.7	6	13.0	12.4	55.4
I 08	304	05.5		09.8	132	33.1	14.6	6	25.4	12.3	55.4
E 09	319	05.5	. .	10.6	147	06.7	14.6	6	37.7	12.3	55.4
R 10	334	05.6		11.5	161	40.3	14.6	6	50.0	12.2	55.4
C 11	349	05.6		12.3	176	13.9	14.5	7	02.2	12.3	55.4
O 12	4	05.6	S14	13.1	190	47.4	14.4	N 7	14.5	12.2	55.5
L 13	19	05.6		13.9	205	20.8	14.4	7	26.7	12.2	55.5
E 14	34	05.7		14.7	219	54.2	14.4	7	38.9	12.2	55.5
S 15	49	05.7	. .	15.5	234	27.6	14.3	7	51.1	12.2	55.5
16	64	05.7		16.3	249	00.9	14.2	8	03.3	12.1	55.5
17	79	05.7		17.1	263	34.1	14.3	8	15.4	12.1	55.6
18	94	05.7	S14	17.9	278	07.4	14.1	N 8	27.5	12.1	55.6
19	109	05.8		18.7	292	40.5	14.1	8	39.6	12.0	55.6
20	124	05.8		19.5	307	13.6	14.1	8	51.6	12.1	55.6
21	139	05.8	. .	20.3	321	46.7	14.0	9	03.7	12.0	55.6
22	154	05.8		21.1	336	19.7	13.9	9	15.7	11.9	55.6
23	169	05.8		21.9	350	52.6	13.9	9	27.6	11.9	55.7
1 00	184	05.9	S14	22.7	5	25.5	13.8	N 9	39.5	11.9	55.7
01	199	05.9		23.5	19	58.3	13.8	9	51.4	11.9	55.7
02	214	05.9		24.3	34	31.1	13.7	10	03.3	11.8	55.7
03	229	05.9	. .	25.1	49	03.8	13.6	10	15.1	11.8	55.8
04	244	05.9		25.9	63	36.4	13.6	10	26.9	11.8	55.8
05	259	06.0		26.7	78	09.0	13.6	10	38.7	11.7	55.8
06	274	06.0	S14	27.5	92	41.6	13.4	N10	50.4	11.7	55.8
07	289	06.0		28.3	107	14.0	13.5	11	02.1	11.6	55.8
J 08	304	06.0		29.1	121	46.5	13.3	11	13.7	11.6	55.9
U 09	319	06.0	. .	29.9	136	18.8	13.3	11	25.3	11.6	55.9
E 10	334	06.0		30.7	150	51.1	13.2	11	36.9	11.5	55.9
V 11	349	06.1		31.5	165	23.3	13.2	11	48.4	11.4	55.9
E 12	4	06.1	S14	32.3	179	55.5	13.1	N11	59.8	11.4	55.9
S 13	19	06.1		33.1	194	27.6	13.0	12	11.2	11.4	56.0
14	34	06.1		33.9	208	59.6	13.0	12	22.6	11.3	56.0
15	49	06.1	. .	34.7	223	31.6	12.9	12	33.9	11.3	56.0
16	64	06.1		35.5	238	03.5	12.8	12	45.2	11.2	56.0
17	79	06.1		36.3	252	35.3	12.8	12	56.4	11.2	56.0
18	94	06.2	S14	37.1	267	07.1	12.7	N13	07.6	11.1	56.1
19	109	06.2		37.9	281	38.8	12.6	13	18.7	11.1	56.1
20	124	06.2		38.7	296	10.4	12.5	13	29.8	11.0	56.1
21	139	06.2	. .	39.5	310	41.9	12.5	13	40.8	11.0	56.1
22	154	06.2		40.3	325	13.4	12.4	13	51.8	10.9	56.1
23	169	06.2		41.1	339	44.8	12.4	14	02.7	10.8	56.2
2 00	184	06.2	S14	41.8	354	16.2	12.3	N14	13.5	10.8	56.2
01	199	06.2		42.6	8	47.5	12.2	14	24.3	10.7	56.2
02	214	06.3		43.4	23	18.7	12.1	14	35.0	10.7	56.2
03	229	06.3	. .	44.2	37	49.8	12.0	14	45.7	10.6	56.2
04	244	06.3		45.0	52	20.8	12.0	14	56.3	10.5	56.3
05	259	06.3		45.8	66	51.8	11.9	15	06.8	10.5	56.3
06	274	06.3	S14	46.6	81	22.7	11.9	N15	17.3	10.4	56.3
07	289	06.3		47.4	95	53.6	11.7	15	27.7	10.3	56.3
V 08	304	06.3		48.2	110	24.3	11.7	15	38.0	10.3	56.3
I 09	319	06.3	. .	49.0	124	55.0	11.6	15	48.3	10.2	56.4
E 10	334	06.3		49.7	139	25.6	11.5	15	58.5	10.1	56.4
R 11	349	06.3		50.5	153	56.1	11.5	16	08.6	10.0	56.4
N 12	4	06.3	S14	51.3	168	26.6	11.4	N16	18.6	10.0	56.4
E 13	19	06.3		52.1	182	57.0	11.3	16	28.6	9.9	56.4
S 14	34	06.4		52.9	197	27.3	11.2	16	38.5	9.9	56.5
15	49	06.4	. .	53.7	211	57.5	11.1	16	48.4	9.7	56.5
16	64	06.4		54.5	226	27.6	11.1	16	58.1	9.7	56.5
17	79	06.4		55.3	240	57.7	11.0	17	07.8	9.6	56.5
18	94	06.4	S14	56.0	255	27.7	10.9	N17	17.4	9.5	56.6
19	109	06.4		56.8	269	57.6	10.9	17	26.9	9.4	56.6
20	124	06.4		57.6	284	27.5	10.7	17	36.3	9.4	56.6
21	139	06.4	. .	58.4	298	57.2	10.7	17	45.7	9.2	56.6
22	154	06.4	14	59.2	313	26.9	10.6	17	54.9	9.2	56.6
23	169	06.4	S15	00.0	327	56.5	10.5	N18	04.1	9.1	56.7
	SD	16.1	d	0.8	SD		15.1		15.2		15.4

Lat.	Crepúsculo Náutico	Crepúsculo Civil	Orto Sol	Orto Luna 31	Orto Luna 1	Orto Luna 2	Orto Luna 3
°	h m	h m	h m	h m	h m	h m	h m
N 72	06 06	07 29	08 57	15 43	15 14	14 25	▭
N 70	06 02	07 16	08 31	15 54	15 36	15 10	▭
68	05 59	07 06	08 11	16 03	15 53	15 40	15 19
66	05 55	06 57	07 55	16 11	16 07	16 03	15 59
64	05 52	06 49	07 42	16 18	16 18	16 21	16 26
62	05 50	06 43	07 32	16 23	16 28	16 36	16 48
60	05 48	06 37	07 22	16 28	16 37	16 48	17 05
N 58	05 45	06 32	07 14	16 33	16 44	16 59	17 20
56	05 43	06 27	07 07	16 37	16 51	17 09	17 32
54	05 41	06 23	07 01	16 40	16 57	17 17	17 43
52	05 39	06 19	06 55	16 43	17 02	17 25	17 53
50	05 37	06 16	06 50	16 46	17 07	17 31	18 02
45	05 33	06 08	06 38	16 53	17 18	17 46	18 20
N 40	05 29	06 01	06 29	16 58	17 26	17 58	18 36
35	05 25	05 55	06 21	17 03	17 34	18 09	18 49
30	05 21	05 49	06 14	17 07	17 41	18 18	19 00
20	05 13	05 39	06 01	17 14	17 52	18 34	19 19
N 10	05 04	05 29	05 51	17 21	18 03	18 48	19 36
0	04 54	05 19	05 40	17 27	18 12	19 01	19 52
S 10	04 43	05 08	05 30	17 33	18 22	19 14	20 08
20	04 28	04 55	05 18	17 40	18 33	19 28	20 26
30	04 10	04 40	05 05	17 47	18 45	19 44	20 46
35	03 59	04 31	04 58	17 52	18 52	19 54	20 57
40	03 45	04 20	04 49	17 57	19 00	20 05	21 11
45	03 27	04 07	04 39	18 02	19 09	20 18	21 27
S 50	03 04	03 50	04 26	18 09	19 21	20 34	21 46
52	02 53	03 42	04 21	18 13	19 26	20 41	21 56
54	02 40	03 33	04 14	18 16	19 32	20 49	22 06
56	02 24	03 23	04 07	18 20	19 38	20 59	22 18
58	02 05	03 12	03 59	18 25	19 46	21 09	22 32
S 60	01 40	02 58	03 50	18 30	19 54	21 21	22 49

Lat.	Ocaso Sol	Crepúsculo Civil	Crepúsculo Náutico	Ocaso Luna 31	Ocaso Luna 1	Ocaso Luna 2	Ocaso Luna 3
°	h m	h m	h m	h m	h m	h m	h m
N 72	14 29	15 56	17 19	06 22	08 24	10 52	▭
N 70	14 55	16 09	17 23	06 13	08 04	10 08	▭
68	15 15	16 20	17 27	06 06	07 48	09 39	11 46
66	15 31	16 29	17 30	06 00	07 36	09 18	11 07
64	15 44	16 37	17 33	05 55	07 26	09 01	10 40
62	15 55	16 43	17 36	05 51	07 17	08 47	10 19
60	16 04	16 49	17 39	05 47	07 10	08 35	10 03
N 58	16 12	16 54	17 41	05 43	07 03	08 25	09 48
56	16 19	16 59	17 43	05 40	06 57	08 16	09 36
54	16 26	17 03	17 45	05 38	06 52	08 09	09 26
52	16 32	17 07	17 47	05 35	06 48	08 02	09 17
50	16 37	17 11	17 49	05 33	06 43	07 55	09 08
45	16 48	17 19	17 53	05 29	06 34	07 42	08 51
N 40	16 58	17 26	17 58	05 25	06 27	07 31	08 36
35	17 06	17 32	18 02	05 21	06 20	07 21	08 24
30	17 13	17 38	18 06	05 18	06 15	07 13	08 14
20	17 25	17 48	18 14	05 13	06 05	06 59	07 55
N 10	17 37	17 58	18 23	05 08	05 56	06 47	07 40
0	17 47	18 08	18 33	05 04	05 48	06 35	07 25
S 10	17 58	18 19	18 45	05 00	05 40	06 24	07 10
20	18 09	18 32	18 59	04 55	05 32	06 11	06 55
30	18 22	18 48	19 18	04 50	05 22	05 58	06 37
35	18 30	18 57	19 29	04 47	05 17	05 49	06 27
40	18 39	19 08	19 44	04 44	05 11	05 40	06 15
45	18 49	19 21	20 01	04 40	05 03	05 30	06 01
S 50	19 02	19 38	20 25	04 36	04 55	05 17	05 44
52	19 08	19 46	20 36	04 34	04 51	05 11	05 36
54	19 14	19 55	20 50	04 31	04 46	05 04	05 27
56	19 21	20 06	21 06	04 29	04 42	04 57	05 17
58	19 30	20 17	21 26	04 26	04 36	04 49	05 06
S 60	19 39	20 32	21 52	04 23	04 30	04 40	04 53

Día	SOL E.T. (+) 00h	SOL E.T. (+) 12h	SOL Pas. Mer.	LUNA Pas. Sup.	LUNA Mer. Inf.	LUNA Edad	LUNA Fase
d	m s	m s	h m	h m	h m	d %	
31	16 21	16 22	11 44	23 38	11 16	15 99	
1	16 23	16 24	11 44	24 24	12 00	16 100	◯
2	16 25	16 25	11 44	00 24	12 48	17 98	

T.U.	ARIES	VENUS −3.9		MARTE +0.1		JUPITER −2.5		SATURNO −0.3	
d h	A.H.G.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.
	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
3 00	42 19.1	200 26.3	S 7 34.1	95 08.3	S21 10.0	295 18.6	N22 23.7	329 40.5	N20 35.2
01	57 21.5	215 25.8	35.3	110 08.9	09.5	310 21.0	23.7	344 43.1	35.1
02	72 24.0	230 25.4	36.5	125 09.6	09.0	325 23.5	23.7	359 45.7	35.1
03	87 26.5	245 24.9	. . 37.7	140 10.3	. . 08.6	340 26.0	. . 23.7	14 48.4	. . 35.1
04	102 28.9	260 24.5	38.8	155 11.0	08.1	355 28.4	23.7	29 51.0	35.1
05	117 31.4	275 24.0	40.0	170 11.6	07.6	10 30.9	23.7	44 53.6	35.1
06	132 33.9	290 23.6	S 7 41.2	185 12.3	S21 07.1	25 33.4	N22 23.7	59 56.2	N20 35.0
S 07	147 36.3	305 23.1	42.4	200 13.0	06.6	40 35.8	23.7	74 58.9	35.0
08	162 38.8	320 22.7	43.5	215 13.7	06.2	55 38.3	23.7	90 01.5	35.0
A 09	177 41.3	335 22.2	. . 44.7	230 14.3	. . 05.7	70 40.8	. . 23.7	105 04.1	. . 35.0
10	192 43.7	350 21.8	45.9	245 15.0	05.2	85 43.2	23.7	120 06.8	35.0
B 11	207 46.2	5 21.3	47.1	260 15.7	04.7	100 45.7	23.7	135 09.4	34.9
12	222 48.7	20 20.8	S 7 48.2	275 16.4	S21 04.2	115 48.2	N22 23.7	150 12.0	N20 34.9
A 13	237 51.1	35 20.4	49.4	290 17.0	03.7	130 50.7	23.7	165 14.6	34.9
D 14	252 53.6	50 19.9	50.6	305 17.7	03.3	145 53.1	23.7	180 17.3	34.9
15	267 56.0	65 19.5	. . 51.8	320 18.4	. . 02.8	160 55.6	. . 23.7	195 19.9	. . 34.9
O 16	282 58.5	80 19.0	53.0	335 19.1	02.3	175 58.1	23.7	210 22.5	34.8
17	298 01.0	95 18.6	54.1	350 19.7	01.8	191 00.6	23.7	225 25.1	34.8
18	313 03.4	110 18.1	S 7 55.3	5 20.4	S21 01.3	206 03.0	N22 23.7	240 27.8	N20 34.8
19	328 05.9	125 17.6	56.5	20 21.1	00.8	221 05.5	23.7	255 30.4	34.8
20	343 08.4	140 17.2	57.6	35 21.8	21 00.4	236 08.0	23.8	270 33.0	34.8
21	358 10.8	155 16.7	7 58.8	50 22.4	20 59.9	251 10.4	. . 23.8	285 35.7	. . 34.7
22	13 13.3	170 16.3	8 00.0	65 23.1	59.4	266 12.9	23.8	300 38.3	34.7
23	28 15.8	185 15.8	01.2	80 23.8	58.9	281 15.4	23.8	315 40.9	34.7
4 00	43 18.2	200 15.3	S 8 02.3	95 24.5	S20 58.4	296 17.9	N22 23.8	330 43.6	N20 34.7
01	58 20.7	215 14.9	03.5	110 25.1	57.9	311 20.3	23.8	345 46.2	34.7
02	73 23.1	230 14.4	04.7	125 25.8	57.4	326 22.8	23.8	0 48.8	34.6
03	88 25.6	245 14.0	. . 05.9	140 26.5	. . 57.0	341 25.3	. . 23.8	15 51.4	. . 34.6
04	103 28.1	260 13.5	07.0	155 27.2	56.5	356 27.8	23.8	30 54.1	34.6
05	118 30.5	275 13.0	08.2	170 27.8	56.0	11 30.3	23.8	45 56.7	34.6
06	133 33.0	290 12.6	S 8 09.4	185 28.5	S20 55.5	26 32.7	N22 23.8	60 59.3	N20 34.6
D 07	148 35.5	305 12.1	10.5	200 29.2	55.0	41 35.2	23.8	76 02.0	34.5
O 08	163 37.9	320 11.7	11.7	215 29.9	54.5	56 37.7	23.8	91 04.6	34.5
09	178 40.4	335 11.2	. . 12.9	230 30.5	. . 54.0	71 40.2	. . 23.8	106 07.2	. . 34.5
M 10	193 42.9	350 10.7	14.1	245 31.2	53.5	86 42.6	23.8	121 09.9	34.5
I 11	208 45.3	5 10.3	15.2	260 31.9	53.1	101 45.1	23.8	136 12.5	34.5
12	223 47.8	20 09.8	S 8 16.4	275 32.6	S20 52.6	116 47.6	N22 23.8	151 15.1	N20 34.4
N 13	238 50.3	35 09.3	17.6	290 33.2	52.1	131 50.1	23.9	166 17.7	34.4
G 14	253 52.7	50 08.9	18.7	305 33.9	51.6	146 52.6	23.9	181 20.4	34.4
O 15	268 55.2	65 08.4	. . 19.9	320 34.6	. . 51.1	161 55.0	. . 23.9	196 23.0	. . 34.4
16	283 57.6	80 07.9	21.1	335 35.3	50.6	176 57.5	23.9	211 25.6	34.3
17	299 00.1	95 07.5	22.2	350 35.9	50.1	192 00.0	23.9	226 28.3	34.3
18	314 02.6	110 07.0	S 8 23.4	5 36.6	S20 49.6	207 02.5	N22 23.9	241 30.9	N20 34.3
19	329 05.0	125 06.6	24.6	20 37.3	49.1	222 05.0	23.9	256 33.5	34.3
20	344 07.5	140 06.1	25.7	35 38.0	48.6	237 07.5	23.9	271 36.2	34.3
21	359 10.0	155 05.6	. . 26.9	50 38.6	. . 48.2	252 09.9	. . 23.9	286 38.8	. . 34.2
22	14 12.4	170 05.2	28.1	65 39.3	47.7	267 12.4	23.9	301 41.4	34.2
23	29 14.9	185 04.7	29.2	80 40.0	47.2	282 14.9	23.9	316 44.1	34.2
5 00	44 17.4	200 04.2	S 8 30.4	95 40.7	S20 46.7	297 17.4	N22 23.9	331 46.7	N20 34.2
01	59 19.8	215 03.8	31.6	110 41.4	46.2	312 19.9	23.9	346 49.3	34.2
02	74 22.3	230 03.3	32.7	125 42.0	45.7	327 22.4	23.9	1 52.0	34.1
03	89 24.8	245 02.8	. . 33.9	140 42.7	. . 45.2	342 24.8	. . 23.9	16 54.6	. . 34.1
04	104 27.2	260 02.3	35.1	155 43.4	44.7	357 27.3	24.0	31 57.2	34.1
05	119 29.7	275 01.9	36.2	170 44.1	44.2	12 29.8	24.0	46 59.9	34.1
06	134 32.1	290 01.4	S 8 37.4	185 44.7	S20 43.7	27 32.3	N22 24.0	62 02.5	N20 34.1
07	149 34.6	305 00.9	38.6	200 45.4	43.2	42 34.8	24.0	77 05.1	34.0
08	164 37.1	320 00.5	39.7	215 46.1	42.7	57 37.3	24.0	92 07.8	34.0
L 09	179 39.5	335 00.0	. . 40.9	230 46.8	. . 42.2	72 39.8	. . 24.0	107 10.4	. . 34.0
U 10	194 42.0	349 59.5	42.0	245 47.4	41.7	87 42.3	24.0	122 13.0	34.0
11	209 44.5	4 59.1	43.2	260 48.1	41.2	102 44.7	24.0	137 15.7	34.0
N 12	224 46.9	19 58.6	S 8 44.4	275 48.8	S20 40.7	117 47.2	N22 24.0	152 18.3	N20 33.9
E 13	239 49.4	34 58.1	45.5	290 49.5	40.2	132 49.7	24.0	167 20.9	33.9
S 14	254 51.9	49 57.6	46.7	305 50.1	39.7	147 52.2	24.0	182 23.6	33.9
15	269 54.3	64 57.2	. . 47.8	320 50.8	. . 39.2	162 54.7	. . 24.0	197 26.2	. . 33.9
16	284 56.8	79 56.7	49.0	335 51.5	38.7	177 57.2	24.0	212 28.8	33.9
17	299 59.3	94 56.2	50.2	350 52.2	38.2	192 59.7	24.0	227 31.5	33.8
18	315 01.7	109 55.8	S 8 51.3	5 52.8	S20 37.7	208 02.2	N22 24.1	242 34.1	N20 33.8
19	330 04.2	124 55.3	52.5	20 53.5	37.2	223 04.7	24.1	257 36.7	33.8
20	345 06.6	139 54.8	53.6	35 54.2	36.7	238 07.2	24.1	272 39.4	33.8
21	0 09.1	154 54.3	. . 54.8	50 54.9	. . 36.2	253 09.7	. . 24.1	287 42.0	. . 33.7
22	15 11.6	169 53.9	56.0	65 55.5	35.7	268 12.1	24.1	302 44.6	33.7
23	30 14.0	184 53.4	57.1	80 56.2	35.2	283 14.6	24.1	317 47.3	33.7
	h m								
Pas. Mer.	21 03.3	v −0.5	d 1.2	v 0.7	d 0.5	v 2.5	d 0.0	v 2.6	d 0.0

ESTRELLAS		
Nombre	A.H.S.	Dec.
	° ′	° ′
Acamar	315 24.8	S40 17.9
Achernar	335 32.9	S57 13.8
Acrux	173 20.3	S63 06.2
Adhara	255 19.6	S28 58.2
Aldebaran	290 59.6	N16 30.8
Alioth	166 29.1	N55 57.0
Alkaid	153 06.5	N49 18.3
Al Na'ir	27 55.0	S46 57.4
Alnilam	275 55.4	S 1 12.0
Alphard	218 05.1	S 8 39.8
Alphecca	126 19.1	N26 42.7
Alpheratz	357 52.8	N29 06.1
Altair	62 17.3	N 8 52.5
Ankaa	353 24.3	S42 18.0
Antares	112 37.9	S26 26.1
Arcturus	146 04.4	N19 10.5
Atria	107 48.5	S69 01.9
Avior	234 21.7	S59 30.5
Bellatrix	278 41.6	N 6 21.1
Betelgeuse	271 11.0	N 7 24.5
Canopus	263 59.9	S52 41.5
Capella	280 47.6	N45 59.9
Deneb	49 37.8	N45 17.4
Denebola	182 43.2	N14 33.9
Diphda	349 04.8	S17 58.7
Dubhe	194 03.1	N61 44.4
Elnath	278 23.9	N28 36.5
Eltanin	90 50.8	N51 29.6
Enif	33 56.1	N 9 53.1
Fomalhaut	15 33.8	S29 36.9
Gacrux	172 11.8	S57 07.1
Gienah	176 02.0	S17 32.8
Hadar	149 01.7	S60 22.7
Hamal	328 10.8	N23 28.3
Kaus Aust.	83 56.2	S34 23.1
Kochab	137 20.7	N74 09.0
Markab	13 47.3	N15 13.0
Menkar	314 24.3	N 4 05.8
Menkent	148 18.9	S36 22.5
Miaplacidus	221 41.8	S69 43.1
Mirfak	308 53.1	N49 52.0
Nunki	76 09.8	S26 17.7
Peacock	53 33.6	S56 44.0
Pollux	243 38.8	N28 01.3
Procyon	245 09.2	N 5 13.3
Rasalhague	96 15.2	N12 33.7
Regulus	207 53.3	N11 57.6
Rigel	281 20.6	S 8 11.9
Rigil Kent.	140 05.2	S60 50.4
Sabik	102 23.4	S15 43.5
Schedar	349 50.6	N56 32.9
Shaula	96 34.7	S37 06.3
Sirius	258 41.6	S16 42.9
Spica	158 41.2	S11 10.0
Suhail	222 59.3	S43 26.0
Vega	80 45.4	N38 47.3
Zuben'ubi	137 15.9	S16 02.8

	A.H.S.	Pas. Mer.
	° ′	h m
Venus	156 57.1	10 39
Marte	52 06.2	17 38
Júpiter	252 59.7	4 14
Saturno	287 25.3	1 57

T.U.	SOL				LUNA					
	A.H.G.		Dec.		A.H.G.	v	Dec.	d	P.H.	
d h	° ′		° ′		° ′	′	° ′	′	′	
3 00	184 06.4		S15 00.7		342 26.0	10.4	N18 13.2	9.0	56.7	
01	199 06.4		01.5		356 55.4	10.4	18 22.2	9.0	56.7	
02	214 06.4		02.3		11 24.8	10.3	18 31.2	8.8	56.7	
03	229 06.4	. .	03.1		25 54.1	10.2	18 40.0	8.7	56.7	
04	244 06.4		03.9		40 23.3	10.1	18 48.7	8.7	56.8	
05	259 06.4		04.6		54 52.4	10.0	18 57.4	8.5	56.8	
06	274 06.4		S15 05.4		69 21.4	10.0	N19 05.9	8.5	56.8	
07	289 06.4		06.2		83 50.4	9.9	19 14.4	8.3	56.8	
S 08	304 06.4		07.0		98 19.3	9.8	19 22.7	8.3	56.8	
A 09	319 06.4	. .	07.8		112 48.1	9.7	19 31.0	8.2	56.9	
10	334 06.4		08.5		127 16.8	9.7	19 39.2	8.0	56.9	
B 11	349 06.4		09.3		141 45.5	9.5	19 47.2	8.0	56.9	
A 12	4 06.4		S15 10.1		156 14.0	9.5	N19 55.2	7.9	56.9	
13	19 06.4		10.9		170 42.5	9.4	20 03.1	7.7	56.9	
D 14	34 06.4		11.6		185 10.9	9.4	20 10.8	7.7	57.0	
15	49 06.4	. .	12.4		199 39.3	9.2	20 18.5	7.5	57.0	
O 16	64 06.4		13.2		214 07.5	9.2	20 26.0	7.5	57.0	
17	79 06.4		14.0		228 35.7	9.1	20 33.5	7.3	57.0	
18	94 06.4		S15 14.7		243 03.8	9.0	N20 40.8	7.2	57.0	
19	109 06.4		15.5		257 31.8	9.0	20 48.0	7.1	57.1	
20	124 06.4		16.3		271 59.8	8.8	20 55.1	7.1	57.1	
21	139 06.4	. .	17.1		286 27.6	8.8	21 02.2	6.8	57.1	
22	154 06.4		17.8		300 55.4	8.7	21 09.0	6.8	57.1	
23	169 06.4		18.6		315 23.1	8.7	21 15.8	6.7	57.1	
4 00	184 06.4		S15 19.4		329 50.8	8.6	N21 22.5	6.5	57.2	
01	199 06.4		20.2		344 18.4	8.5	21 29.0	6.5	57.2	
02	214 06.3		20.9		358 45.9	8.4	21 35.5	6.3	57.2	
03	229 06.3	. .	21.7		13 13.3	8.3	21 41.8	6.2	57.2	
04	244 06.3		22.5		27 40.6	8.3	21 48.0	6.1	57.2	
05	259 06.3		23.2		42 07.9	8.2	21 54.1	5.9	57.3	
06	274 06.3		S15 24.0		56 35.1	8.2	N22 00.0	5.9	57.3	
07	289 06.3		24.8		71 02.3	8.0	22 05.9	5.7	57.3	
D 08	304 06.3		25.5		85 29.3	8.0	22 11.6	5.6	57.3	
O 09	319 06.3	. .	26.3		99 56.3	8.0	22 17.2	5.4	57.3	
M 10	334 06.3		27.1		114 23.3	7.8	22 22.6	5.4	57.4	
I 11	349 06.3		27.8		128 50.1	7.8	22 28.0	5.2	57.4	
12	4 06.3		S15 28.6		143 16.9	7.8	N22 33.2	5.1	57.4	
N 13	19 06.3		29.4		157 43.7	7.6	22 38.3	4.9	57.4	
G 14	34 06.2		30.1		172 10.3	7.6	22 43.2	4.8	57.4	
O 15	49 06.2	. .	30.9		186 36.9	7.6	22 48.0	4.7	57.5	
16	64 06.2		31.7		201 03.5	7.5	22 52.7	4.6	57.5	
17	79 06.2		32.4		215 30.0	7.4	22 57.3	4.4	57.5	
18	94 06.2		S15 33.2		229 56.4	7.3	N23 01.7	4.3	57.5	
19	109 06.2		34.0		244 22.7	7.3	23 06.0	4.2	57.5	
20	124 06.2		34.7		258 49.0	7.3	23 10.2	4.0	57.6	
21	139 06.2	. .	35.5		273 15.3	7.1	23 14.2	3.9	57.6	
22	154 06.1		36.3		287 41.4	7.2	23 18.1	3.7	57.6	
23	169 06.1		37.0		302 07.6	7.0	23 21.8	3.7	57.6	
5 00	184 06.1		S15 37.8		316 33.6	7.1	N23 25.5	3.4	57.6	
01	199 06.1		38.5		330 59.7	6.9	23 28.9	3.4	57.7	
02	214 06.1		39.3		345 25.6	6.9	23 32.3	3.2	57.7	
03	229 06.1	. .	40.1		359 51.5	6.9	23 35.5	3.0	57.7	
04	244 06.1		40.8		14 17.4	6.8	23 38.5	2.9	57.7	
05	259 06.0		41.6		28 43.2	6.8	23 41.4	2.8	57.7	
06	274 06.0		S15 42.3		43 09.0	6.7	N23 44.2	2.6	57.7	
07	289 06.0		43.1		57 34.7	6.7	23 46.8	2.5	57.8	
L 08	304 06.0		43.9		72 00.4	6.6	23 49.3	2.4	57.8	
U 09	319 06.0	. .	44.6		86 26.0	6.6	23 51.7	2.2	57.8	
N 10	334 06.0		45.4		100 51.6	6.5	23 53.9	2.0	57.8	
11	349 05.9		46.1		115 17.1	6.5	23 55.9	1.9	57.8	
12	4 05.9		S15 46.9		129 42.6	6.5	N23 57.8	1.8	57.9	
E 13	19 05.9		47.6		144 08.1	6.4	23 59.6	1.6	57.9	
14	34 05.9		48.4		158 33.5	6.4	24 01.2	1.5	57.9	
S 15	49 05.9	. .	49.1		172 58.9	6.4	24 02.7	1.3	57.9	
16	64 05.8		49.9		187 24.3	6.3	24 04.0	1.2	57.9	
17	79 05.8		50.7		201 49.6	6.3	24 05.2	1.0	58.0	
18	94 05.8		S15 51.4		216 14.9	6.3	N24 06.2	0.9	58.0	
19	109 05.8		52.2		230 40.2	6.2	24 07.1	0.7	58.0	
20	124 05.7		52.9		245 05.4	6.2	24 07.8	0.6	58.0	
21	139 05.7	. .	53.7		259 30.6	6.2	24 08.4	0.4	58.0	
22	154 05.7		54.4		273 55.8	6.2	24 08.8	0.2	58.0	
23	169 05.7		55.2		288 21.0	6.1	N24 09.0	0.2	58.1	
	SD 16.2		d 0.8		SD	15.5		15.6		15.8

Lat.	Crepúsculo Náutico	Crepúsculo Civil	Orto Sol	Orto Luna 3	Orto Luna 4	Orto Luna 5	Orto Luna 6
°	h m	h m	h m	h m	h m	h m	h m
N 72	06 18	07 43	09 17	▭	▭	▭	▭
N 70	06 13	07 28	08 46	▭	▭	▭	▭
68	06 08	07 16	08 24	15 19	▭	▭	▭
66	06 04	07 06	08 06	15 59	15 54	15 49	17 10
64	06 00	06 58	07 52	16 26	16 39	17 11	18 17
62	05 57	06 50	07 40	16 48	17 09	17 48	18 52
60	05 54	06 44	07 30	17 05	17 32	18 14	19 18
N 58	05 51	06 38	07 21	17 20	17 50	18 35	19 38
56	05 49	06 33	07 13	17 32	18 05	18 52	19 55
54	05 46	06 29	07 06	17 43	18 19	19 07	20 09
52	05 44	06 24	07 00	17 53	18 30	19 19	20 21
50	05 42	06 20	06 55	18 02	18 41	19 31	20 32
45	05 37	06 12	06 43	18 20	19 02	19 54	20 55
N 40	05 32	06 04	06 32	18 36	19 20	20 13	21 13
35	05 27	05 57	06 24	18 49	19 35	20 28	21 29
30	05 23	05 51	06 16	19 00	19 48	20 42	21 42
20	05 14	05 40	06 03	19 19	20 10	21 05	22 05
N 10	05 04	05 29	05 51	19 36	20 29	21 25	22 24
0	04 54	05 19	05 40	19 52	20 47	21 44	22 42
S 10	04 42	05 07	05 29	20 08	21 05	22 03	23 01
20	04 27	04 54	05 17	20 26	21 25	22 23	23 20
30	04 07	04 38	05 03	20 46	21 47	22 47	23 43
35	03 55	04 28	04 55	20 57	22 00	23 01	23 56
40	03 40	04 16	04 46	21 11	22 15	23 16	24 12
45	03 22	04 02	04 35	21 27	22 34	23 35	24 30
S 50	02 58	03 45	04 21	21 46	22 56	23 59	24 52
52	02 45	03 36	04 15	21 56	23 07	24 11	00 11
54	02 31	03 27	04 08	22 06	23 20	24 24	00 24
56	02 14	03 16	04 01	22 18	23 34	24 39	00 39
58	01 52	03 03	03 52	22 32	23 50	24 56	00 56
S 60	01 24	02 48	03 42	22 49	24 11	00 11	01 18

Lat.	Ocaso Sol	Crepúsculo Civil	Crepúsculo Náutico	Ocaso Luna 3	Ocaso Luna 4	Ocaso Luna 5	Ocaso Luna 6
°	h m	h m	h m	h m	h m	h m	h m
N 72	14 09	15 43	17 07	▭	▭	▭	▭
N 70	14 40	15 58	17 13	▭	▭	▭	▭
68	15 02	16 10	17 18	11 46	▭	▭	▭
66	15 20	16 20	17 22	11 07	13 03	15 07	15 48
64	15 34	16 28	17 26	10 40	12 19	13 46	14 41
62	15 46	16 36	17 29	10 19	11 50	13 09	14 05
60	15 56	16 42	17 32	10 03	11 28	12 43	13 40
N 58	16 05	16 48	17 35	09 48	11 09	12 22	13 19
56	16 13	16 53	17 37	09 36	10 54	12 05	13 03
54	16 20	16 58	17 40	09 26	10 41	11 50	12 48
52	16 26	17 02	17 42	09 17	10 30	11 38	12 36
50	16 32	17 06	17 45	09 08	10 20	11 27	12 25
45	16 44	17 15	17 50	08 51	09 59	11 03	12 02
N 40	16 54	17 23	17 55	08 36	09 42	10 45	11 43
35	17 03	17 29	17 59	08 24	09 27	10 29	11 27
30	17 11	17 35	18 04	08 14	09 15	10 16	11 14
20	17 24	17 47	18 13	07 55	08 54	09 53	10 51
N 10	17 36	17 58	18 23	07 40	08 35	09 33	10 31
0	17 47	18 09	18 33	07 25	08 18	09 14	10 12
S 10	17 58	18 20	18 46	07 10	08 01	08 56	09 53
20	18 11	18 34	19 01	06 55	07 43	08 36	09 33
30	18 25	18 50	19 20	06 37	07 22	08 13	09 10
35	18 33	19 00	19 33	06 27	07 09	07 59	08 56
40	18 42	19 12	19 48	06 15	06 55	07 44	08 40
45	18 53	19 26	20 07	06 01	06 39	07 25	08 21
S 50	19 07	19 44	20 31	05 44	06 18	07 02	07 58
52	19 13	19 52	20 44	05 36	06 08	06 51	07 46
54	19 20	20 02	20 58	05 27	05 57	06 38	07 33
56	19 28	20 13	21 16	05 17	05 45	06 24	07 18
58	19 37	20 26	21 38	05 06	05 31	06 07	07 01
S 60	19 47	20 41	22 09	04 53	05 14	05 47	06 39

Día	SOL E.T. (+) 00ʰ	SOL E.T. (+) 12ʰ	SOL Pas. Mer.	LUNA Pas. Sup.	LUNA Mer. Inf.	LUNA Edad	LUNA Fase
d	m s	m s	h m	h m	h m	d %	
3	16 26	16 26	11 44	01 13	13 39	18 95	
4	16 25	16 25	11 44	02 05	14 33	19 89	◑
5	16 24	16 24	11 44	03 01	15 29	20 81	

T.U.	ARIES	VENUS −3.9		MARTE +0.1		JUPITER −2.5		SATURNO −0.3	
	A.H.G.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
6 00	45 16.5	199 52.9	S 8 58.3	95 56.9	S20 34.7	298 17.1	N22 24.1	332 49.9	N20 33.7
01	60 19.0	214 52.4	8 59.4	110 57.6	34.2	313 19.6	24.1	347 52.6	33.7
02	75 21.4	229 52.0	9 00.6	125 58.3	33.7	328 22.1	24.1	2 55.2	33.6
03	90 23.9	244 51.5	01.8	140 58.9	33.2	343 24.6	24.1	17 57.8	33.6
04	105 26.4	259 51.0	02.9	155 59.6	32.7	358 27.1	24.1	33 00.5	33.6
05	120 28.8	274 50.5	04.1	171 00.3	32.2	13 29.6	24.1	48 03.1	33.6
06	135 31.3	289 50.0	S 9 05.2	186 01.0	S20 31.7	28 32.1	N22 24.1	63 05.7	N20 33.6
07	150 33.8	304 49.6	06.4	201 01.6	31.2	43 34.6	24.2	78 08.4	33.5
M 08	165 36.2	319 49.1	07.5	216 02.3	30.7	58 37.1	24.2	93 11.0	33.5
09	180 38.7	334 48.6	08.7	231 03.0	30.2	73 39.6	24.2	108 13.6	33.5
A 10	195 41.1	349 48.1	09.8	246 03.7	29.7	88 42.1	24.2	123 16.3	33.5
R 11	210 43.6	4 47.7	11.0	261 04.3	29.2	103 44.6	24.2	138 18.9	33.5
T 12	225 46.1	19 47.2	S 9 12.2	276 05.0	S20 28.7	118 47.1	N22 24.2	153 21.6	N20 33.4
13	240 48.5	34 46.7	13.3	291 05.7	28.2	133 49.6	24.2	168 24.2	33.4
E 14	255 51.0	49 46.2	14.5	306 06.4	27.7	148 52.1	24.2	183 26.8	33.4
15	270 53.5	64 45.7	15.6	321 07.1	27.2	163 54.6	24.2	198 29.5	33.4
S 16	285 55.9	79 45.3	16.8	336 07.7	26.7	178 57.1	24.2	213 32.1	33.3
17	300 58.4	94 44.8	17.9	351 08.4	26.2	193 59.6	24.2	228 34.7	33.3
18	316 00.9	109 44.3	S 9 19.1	6 09.1	S20 25.7	209 02.1	N22 24.2	243 37.4	N20 33.3
19	331 03.3	124 43.8	20.2	21 09.8	25.2	224 04.6	24.3	258 40.0	33.3
20	346 05.8	139 43.3	21.4	36 10.4	24.7	239 07.1	24.3	273 42.7	33.3
21	1 08.2	154 42.8	22.5	51 11.1	24.2	254 09.6	24.3	288 45.3	33.2
22	16 10.7	169 42.4	23.7	66 11.8	23.7	269 12.1	24.3	303 47.9	33.2
23	31 13.2	184 41.9	24.8	81 12.5	23.1	284 14.6	24.3	318 50.6	33.2
7 00	46 15.6	199 41.4	S 9 26.0	96 13.1	S20 22.6	299 17.1	N22 24.3	333 53.2	N20 33.2
01	61 18.1	214 40.9	27.1	111 13.8	22.1	314 19.6	24.3	348 55.9	33.2
02	76 20.6	229 40.4	28.3	126 14.5	21.6	329 22.1	24.3	3 58.5	33.1
03	91 23.0	244 39.9	29.4	141 15.2	21.1	344 24.6	24.3	19 01.1	33.1
04	106 25.5	259 39.5	30.6	156 15.9	20.6	359 27.1	24.3	34 03.8	33.1
05	121 28.0	274 39.0	31.7	171 16.5	20.1	14 29.6	24.3	49 06.4	33.1
06	136 30.4	289 38.5	S 9 32.9	186 17.2	S20 19.6	29 32.1	N22 24.3	64 09.1	N20 33.1
M 07	151 32.9	304 38.0	34.0	201 17.9	19.1	44 34.6	24.4	79 11.7	33.0
I 08	166 35.4	319 37.5	35.2	216 18.6	18.6	59 37.1	24.4	94 14.3	33.0
E 09	181 37.8	334 37.0	36.3	231 19.2	18.1	74 39.6	24.4	109 17.0	33.0
R 10	196 40.3	349 36.5	37.4	246 19.9	17.5	89 42.1	24.4	124 19.6	33.0
C 11	211 42.7	4 36.0	38.6	261 20.6	17.0	104 44.6	24.4	139 22.3	32.9
O 12	226 45.2	19 35.6	S 9 39.7	276 21.3	S20 16.5	119 47.1	N22 24.4	154 24.9	N20 32.9
L 13	241 47.7	34 35.1	40.9	291 21.9	16.0	134 49.7	24.4	169 27.5	32.9
E 14	256 50.1	49 34.6	42.0	306 22.6	15.5	149 52.2	24.4	184 30.2	32.9
S 15	271 52.6	64 34.1	43.2	321 23.3	15.0	164 54.7	24.4	199 32.8	32.9
16	286 55.1	79 33.6	44.3	336 24.0	14.5	179 57.2	24.4	214 35.5	32.8
17	301 57.5	94 33.1	45.5	351 24.7	14.0	194 59.7	24.5	229 38.1	32.8
18	317 00.0	109 32.6	S 9 46.6	6 25.3	S20 13.4	210 02.2	N22 24.5	244 40.7	N20 32.8
19	332 02.5	124 32.1	47.7	21 26.0	12.9	225 04.7	24.5	259 43.4	32.8
20	347 04.9	139 31.6	48.9	36 26.7	12.4	240 07.2	24.5	274 46.0	32.8
21	2 07.4	154 31.1	50.0	51 27.4	11.9	255 09.7	24.5	289 48.7	32.7
22	17 09.9	169 30.7	51.2	66 28.0	11.4	270 12.2	24.5	304 51.3	32.7
23	32 12.3	184 30.2	52.3	81 28.7	10.9	285 14.7	24.5	319 53.9	32.7
8 00	47 14.8	199 29.7	S 9 53.5	96 29.4	S20 10.4	300 17.3	N22 24.5	334 56.6	N20 32.7
01	62 17.2	214 29.2	54.6	111 30.1	09.8	315 19.8	24.5	349 59.2	32.6
02	77 19.7	229 28.7	55.7	126 30.8	09.3	330 22.3	24.5	5 01.9	32.6
03	92 22.2	244 28.2	56.9	141 31.4	08.8	345 24.8	24.5	20 04.5	32.6
04	107 24.6	259 27.7	58.0	156 32.1	08.3	0 27.3	24.6	35 07.2	32.6
05	122 27.1	274 27.2	9 59.2	171 32.8	07.8	15 29.8	24.6	50 09.8	32.6
06	137 29.6	289 26.7	S10 00.3	186 33.5	S20 07.3	30 32.3	N22 24.6	65 12.4	N20 32.5
07	152 32.0	304 26.2	01.4	201 34.2	06.7	45 34.8	24.6	80 15.1	32.5
J 08	167 34.5	319 25.7	02.6	216 34.8	06.2	60 37.4	24.6	95 17.7	32.5
U 09	182 37.0	334 25.2	03.7	231 35.5	05.7	75 39.9	24.6	110 20.4	32.5
E 10	197 39.4	349 24.7	04.8	246 36.2	05.2	90 42.4	24.6	125 23.0	32.5
V 11	212 41.9	4 24.2	06.0	261 36.9	04.7	105 44.9	24.6	140 25.7	32.4
E 12	227 44.4	19 23.7	S10 07.1	276 37.5	S20 04.1	120 47.4	N22 24.6	155 28.3	N20 32.4
13	242 46.8	34 23.2	08.2	291 38.2	03.6	135 49.9	24.6	170 30.9	32.4
S 14	257 49.3	49 22.7	09.4	306 38.9	03.1	150 52.5	24.7	185 33.6	32.4
15	272 51.7	64 22.2	10.5	321 39.6	02.6	165 55.0	24.7	200 36.2	32.3
16	287 54.2	79 21.7	11.7	336 40.3	02.1	180 57.5	24.7	215 38.9	32.3
17	302 56.7	94 21.2	12.8	351 40.9	01.5	196 00.0	24.7	230 41.5	32.3
18	317 59.1	109 20.7	S10 13.9	6 41.6	S20 01.0	211 02.5	N22 24.7	245 44.2	N20 32.3
19	333 01.6	124 20.2	15.1	21 42.3	00.5	226 05.0	24.7	260 46.8	32.3
20	348 04.1	139 19.7	16.2	36 43.0	20 00.0	241 07.6	24.7	275 49.5	32.2
21	3 06.5	154 19.2	17.3	51 43.7	19 59.5	256 10.1	24.7	290 52.1	32.2
22	18 09.0	169 18.7	18.5	66 44.3	58.9	271 12.6	24.7	305 54.7	32.2
23	33 11.5	184 18.2	19.6	81 45.0	58.4	286 15.1	24.8	320 57.4	32.2
	h m								
Pas. Mer.	20 51.5	*v* −0.5	*d* 1.1	*v* 0.7	*d* 0.5	*v* 2.5	*d* 0.0	*v* 2.6	*d* 0.0

ESTRELLAS

Nombre	A.H.S.	Dec.
	° ′	° ′
Acamar	315 24.8	S40 17.9
Achernar	335 32.9	S57 13.8
Acrux	173 20.3	S63 06.2
Adhara	255 19.5	S28 58.2
Aldebaran	290 59.6	N16 30.8
Alioth	166 29.1	N55 57.0
Alkaid	153 06.5	N49 18.3
Al Na'ir	27 55.0	S46 57.4
Alnilam	275 55.4	S 1 12.0
Alphard	218 05.1	S 8 39.8
Alphecca	126 19.1	N26 42.7
Alpheratz	357 52.8	N29 06.1
Altair	62 17.3	N 8 52.5
Ankaa	353 24.3	S42 18.0
Antares	112 37.9	S26 26.1
Arcturus	146 04.4	N19 10.5
Atria	107 48.5	S69 01.9
Avior	234 21.7	S59 30.5
Bellatrix	278 41.6	N 6 21.1
Betelgeuse	271 11.0	N 7 24.5
Canopus	263 59.9	S52 41.5
Capella	280 47.6	N45 59.9
Deneb	49 37.8	N45 17.4
Denebola	182 43.2	N14 33.9
Diphda	349 04.8	S17 58.7
Dubhe	194 03.0	N61 44.4
Elnath	278 23.9	N28 36.5
Eltanin	90 50.8	N51 29.6
Enif	33 56.1	N 9 53.1
Fomalhaut	15 33.8	S29 36.9
Gacrux	172 11.7	S57 07.1
Gienah	176 02.0	S17 32.8
Hadar	149 01.7	S60 22.7
Hamal	328 10.8	N23 28.3
Kaus Aust.	83 56.2	S34 23.1
Kochab	137 20.7	N74 09.0
Markab	13 47.3	N15 13.0
Menkar	314 24.3	N 4 05.8
Menkent	148 18.8	S36 22.5
Miaplacidus	221 41.8	S69 43.1
Mirfak	308 53.0	N49 52.0
Nunki	76 09.8	S26 17.7
Peacock	53 33.7	S56 44.0
Pollux	243 38.8	N28 01.3
Procyon	245 09.2	N 5 13.3
Rasalhague	96 15.2	N12 33.7
Regulus	207 53.3	N11 57.6
Rigel	281 20.6	S 8 11.9
Rigil Kent.	140 05.2	S60 50.4
Sabik	102 23.4	S15 43.5
Schedar	349 50.6	N56 33.0
Shaula	96 34.7	S37 06.3
Sirius	258 41.6	S16 42.9
Spica	158 41.2	S11 10.0
Suhail	222 59.2	S43 26.0
Vega	80 45.4	N38 47.3
Zuben'ubi	137 15.9	S16 02.8

	A.H.S.	Pas. Mer.
	° ′	h m
Venus	153 25.7	10 42
Marte	49 57.5	17 34
Júpiter	253 01.4	4 02
Saturno	287 37.6	1 44

T.U.	SOL				LUNA						
	A.H.G.		Dec.		A.H.G.	v	Dec.		d	P.H.	
d h	°	′	°	′	°	′	°	′	′	′	
6 00	184	05.7	S15	55.9	302	46.1	6.1	N24	09.2	0.1	58.1
01	199	05.6		56.7	317	11.2	6.1	24	09.1	0.1	58.1
02	214	05.6		57.4	331	36.3	6.1	24	09.0	0.4	58.1
03	229	05.6	. .	58.2	346	01.4	6.1	24	08.6	0.5	58.1
04	244	05.6		58.9	0	26.5	6.0	24	08.1	0.6	58.2
05	259	05.5	15	59.7	14	51.5	6.1	24	07.5	0.8	58.2
06	274	05.5	S16	00.4	29	16.6	6.0	N24	06.7	0.9	58.2
07	289	05.5		01.2	43	41.6	6.0	24	05.8	1.1	58.2
M 08	304	05.5		01.9	58	06.6	6.0	24	04.7	1.3	58.2
A 09	319	05.4	. .	02.7	72	31.6	6.0	24	03.4	1.4	58.2
R 10	334	05.4		03.4	86	56.6	6.0	24	02.0	1.5	58.3
11	349	05.4		04.1	101	21.6	6.0	24	00.5	1.7	58.3
T 12	4	05.4	S16	04.9	115	46.6	6.0	N23	58.8	1.9	58.3
13	19	05.3		05.6	130	11.6	5.9	23	56.9	2.0	58.3
E 14	34	05.3		06.4	144	36.5	6.0	23	54.9	2.2	58.3
S 15	49	05.3	. .	07.1	159	01.5	6.0	23	52.7	2.3	58.3
16	64	05.2		07.9	173	26.5	6.0	23	50.4	2.4	58.4
17	79	05.2		08.6	187	51.5	6.0	23	48.0	2.6	58.4
18	94	05.2	S16	09.4	202	16.5	6.0	N23	45.4	2.8	58.4
19	109	05.1		10.1	216	41.5	6.0	23	42.6	2.9	58.4
20	124	05.1		10.8	231	06.5	6.0	23	39.7	3.1	58.4
21	139	05.1	. .	11.6	245	31.5	6.0	23	36.6	3.2	58.4
22	154	05.1		12.3	259	56.5	6.1	23	33.4	3.4	58.5
23	169	05.0		13.1	274	21.6	6.0	23	30.0	3.5	58.5
7 00	184	05.0	S16	13.8	288	46.6	6.1	N23	26.5	3.7	58.5
01	199	05.0		14.5	303	11.7	6.0	23	22.8	3.8	58.5
02	214	04.9		15.3	317	36.7	6.1	23	19.0	4.0	58.5
03	229	04.9	. .	16.0	332	01.8	6.1	23	15.0	4.1	58.6
04	244	04.9		16.8	346	26.9	6.2	23	10.9	4.3	58.6
05	259	04.8		17.5	0	52.1	6.1	23	06.6	4.4	58.6
06	274	04.8	S16	18.2	15	17.2	6.2	N23	02.2	4.6	58.6
M 07	289	04.8		19.0	29	42.4	6.2	22	57.6	4.7	58.6
I 08	304	04.7		19.7	44	07.6	6.2	22	52.9	4.9	58.6
E 09	319	04.7	. .	20.4	58	32.8	6.3	22	48.0	5.0	58.7
R 10	334	04.6		21.2	72	58.1	6.2	22	43.0	5.2	58.7
C 11	349	04.6		21.9	87	23.3	6.3	22	37.8	5.3	58.7
O 12	4	04.6	S16	22.6	101	48.6	6.4	N22	32.5	5.4	58.7
L 13	19	04.5		23.4	116	14.0	6.3	22	27.1	5.6	58.7
14	34	04.5		24.1	130	39.3	6.4	22	21.5	5.7	58.7
E 15	49	04.5	. .	24.8	145	04.7	6.4	22	15.8	5.9	58.7
S 16	64	04.4		25.6	159	30.1	6.5	22	09.9	6.1	58.8
17	79	04.4		26.3	173	55.6	6.5	22	03.8	6.1	58.8
18	94	04.3	S16	27.0	188	21.1	6.5	N21	57.7	6.3	58.8
19	109	04.3		27.8	202	46.6	6.6	21	51.4	6.5	58.8
20	124	04.3		28.5	217	12.2	6.6	21	44.9	6.5	58.8
21	139	04.2	. .	29.2	231	37.8	6.6	21	38.4	6.8	58.8
22	154	04.2		29.9	246	03.4	6.7	21	31.6	6.8	58.9
23	169	04.1		30.7	260	29.1	6.7	21	24.8	7.0	58.9
8 00	184	04.1	S16	31.4	274	54.8	6.7	N21	17.8	7.2	58.9
01	199	04.1		32.1	289	20.5	6.8	21	10.6	7.2	58.9
02	214	04.0		32.9	303	46.3	6.9	21	03.4	7.4	58.9
03	229	04.0	. .	33.6	318	12.2	6.9	20	56.0	7.6	58.9
04	244	03.9		34.3	332	38.1	6.9	20	48.4	7.6	58.9
05	259	03.9		35.0	347	04.0	7.0	20	40.8	7.8	59.0
06	274	03.9	S16	35.8	1	30.0	7.0	N20	33.0	8.0	59.0
07	289	03.8		36.5	15	56.0	7.0	20	25.0	8.0	59.0
J 08	304	03.8		37.2	30	22.0	7.1	20	17.0	8.2	59.0
U 09	319	03.7	. .	37.9	44	48.1	7.2	20	08.8	8.4	59.0
10	334	03.7		38.7	59	14.3	7.2	20	00.4	8.4	59.0
E 11	349	03.6		39.4	73	40.5	7.2	19	52.0	8.6	59.1
V 12	4	03.6	S16	40.1	88	06.7	7.3	N19	43.4	8.7	59.1
13	19	03.5		40.8	102	33.0	7.4	19	34.7	8.8	59.1
E 14	34	03.5		41.5	116	59.4	7.3	19	25.9	8.9	59.1
S 15	49	03.4	. .	42.3	131	25.7	7.5	19	17.0	9.1	59.1
16	64	03.4		43.0	145	52.2	7.5	19	07.9	9.2	59.1
17	79	03.3		43.7	160	18.7	7.5	18	58.7	9.3	59.1
18	94	03.3	S16	44.4	174	45.2	7.6	N18	49.4	9.4	59.1
19	109	03.3		45.1	189	11.8	7.6	18	40.0	9.6	59.2
20	124	03.2		45.9	203	38.4	7.7	18	30.4	9.7	59.2
21	139	03.2	. .	46.6	218	05.1	7.8	18	20.7	9.7	59.2
22	154	03.1		47.3	232	31.9	7.7	18	11.0	9.9	59.2
23	169	03.1		48.0	246	58.6	7.9	N18	01.1	10.0	59.2
	SD	16.2	d	0.7	SD		15.9		16.0		16.1

Lat.	Crepúsculo Náutico	Crepúsculo Civil	Orto Sol	Orto Luna 6	Orto Luna 7	Orto Luna 8	Orto Luna 9
°	h m	h m	h m	h m	h m	h m	h m
N 72	06 30	07 57	09 38	▭	▭	▭	22 11
N 70	06 23	07 40	09 02	▭	▭	20 03	22 39
68	06 17	07 27	08 37	▭	17 57	20 49	23 00
66	06 12	07 15	08 17	17 10	19 17	21 19	23 16
64	06 08	07 06	08 02	18 17	19 54	21 41	23 30
62	06 04	06 58	07 49	18 52	20 20	21 59	23 41
60	06 01	06 51	07 38	19 18	20 40	22 14	23 50
N 58	05 57	06 45	07 28	19 38	20 57	22 26	23 58
56	05 54	06 39	07 20	19 55	21 11	22 37	24 06
54	05 51	06 34	07 12	20 09	21 24	22 46	24 12
52	05 49	06 29	07 06	20 21	21 34	22 55	24 18
50	05 46	06 25	07 00	20 32	21 44	23 02	24 23
45	05 40	06 16	06 47	20 55	22 04	23 18	24 34
N 40	05 35	06 07	06 36	21 13	22 20	23 31	24 43
35	05 30	06 00	06 27	21 29	22 34	23 42	24 51
30	05 25	05 54	06 19	21 42	22 46	23 52	24 58
20	05 15	05 42	06 04	22 05	23 06	24 08	00 08
N 10	05 05	05 30	05 52	22 24	23 24	24 23	00 23
0	04 54	05 19	05 40	22 42	23 40	24 36	00 36
S 10	04 41	05 06	05 28	23 01	23 57	24 50	00 50
20	04 25	04 52	05 16	23 20	24 14	00 14	01 04
30	04 05	04 35	05 01	23 43	24 34	00 34	01 20
35	03 52	04 25	04 52	23 56	24 46	00 46	01 30
40	03 36	04 13	04 42	24 12	00 12	00 59	01 40
45	03 17	03 58	04 31	24 30	00 30	01 15	01 53
S 50	02 51	03 39	04 16	24 52	00 52	01 35	02 08
52	02 38	03 30	04 10	00 11	01 03	01 44	02 15
54	02 22	03 20	04 02	00 24	01 15	01 54	02 23
56	02 04	03 08	03 54	00 39	01 29	02 06	02 32
58	01 39	02 55	03 45	00 56	01 45	02 19	02 42
S 60	01 05	02 38	03 34	01 18	02 05	02 34	02 53

Lat.	Ocaso Sol	Crepúsculo Civil	Crepúsculo Náutico	Ocaso Luna 6	Ocaso Luna 7	Ocaso Luna 8	Ocaso Luna 9
°	h m	h m	h m	h m	h m	h m	h m
N 72	13 48	15 29	16 56	▭	▭	▭	16 45
N 70	14 24	15 46	17 03	▭	▭	16 57	16 15
68	14 50	16 00	17 09	▭	17 03	16 10	15 52
66	15 09	16 11	17 14	15 48	15 43	15 39	15 35
64	15 25	16 20	17 18	14 41	15 05	15 16	15 20
62	15 38	16 28	17 22	14 05	14 39	14 57	15 08
60	15 49	16 36	17 26	13 40	14 18	14 42	14 57
N 58	15 58	16 42	17 29	13 19	14 00	14 29	14 48
56	16 07	16 48	17 32	13 03	13 46	14 17	14 40
54	16 14	16 53	17 35	12 48	13 33	14 07	14 33
52	16 21	16 57	17 38	12 36	13 22	13 58	14 26
50	16 27	17 02	17 40	12 25	13 12	13 50	14 21
45	16 40	17 11	17 46	12 02	12 51	13 33	14 08
N 40	16 51	17 20	17 52	11 43	12 35	13 19	13 57
35	17 00	17 27	17 57	11 27	12 20	13 07	13 48
30	17 09	17 33	18 02	11 14	12 08	12 56	13 40
20	17 23	17 46	18 12	10 51	11 46	12 38	13 26
N 10	17 35	17 57	18 22	10 31	11 28	12 22	13 14
0	17 47	18 09	18 34	10 12	11 10	12 07	13 02
S 10	17 59	18 21	18 47	09 53	10 53	11 52	12 50
20	18 12	18 35	19 03	09 33	10 34	11 36	12 38
30	18 27	18 53	19 23	09 10	10 12	11 17	12 23
35	18 36	19 03	19 36	08 56	09 59	11 06	12 15
40	18 46	19 16	19 52	08 40	09 44	10 54	12 05
45	18 58	19 31	20 12	08 21	09 27	10 39	11 54
S 50	19 12	19 50	20 38	07 58	09 05	10 20	11 40
52	19 19	19 59	20 52	07 46	08 54	10 11	11 34
54	19 26	20 09	21 07	07 33	08 42	10 02	11 26
56	19 35	20 21	21 27	07 18	08 29	09 50	11 18
58	19 44	20 35	21 52	07 01	08 13	09 38	11 09
S 60	19 55	20 51	22 29	06 39	07 53	09 23	10 59

Día	SOL E.T. (+) 00h	SOL E.T. (+) 12h	SOL Pas. Mer.	LUNA Pas. Sup.	LUNA Mer. Inf.	LUNA Edad	LUNA Fase
d	m s	m s	h m	h m	h m	d	%
6	16 23	16 21	11 44	03 58	16 27	21	72
7	16 20	16 18	11 44	04 56	17 25	22	61
8	16 17	16 14	11 44	05 54	18 22	23	50

T.U.	ARIES	VENUS −3.9		MARTE +0.2		JUPITER −2.5		SATURNO −0.3	
d h	A.H.G.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.
	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
9 00	48 13.9	199 17.7	S10 20.7	96 45.7	S19 57.9	301 17.6	N22 24.8	336 00.0	N20 32.2
01	63 16.4	214 17.2	21.8	111 46.4	57.4	316 20.2	24.8	351 02.7	32.1
02	78 18.8	229 16.7	23.0	126 47.0	56.8	331 22.7	24.8	6 05.3	32.1
03	93 21.3	244 16.2 . .	24.1	141 47.7 . .	56.3	346 25.2 . .	24.8	21 08.0 . .	32.1
04	108 23.8	259 15.7	25.2	156 48.4	55.8	1 27.7	24.8	36 10.6	32.1
05	123 26.2	274 15.2	26.4	171 49.1	55.3	16 30.2	24.8	51 13.3	32.0
06	138 28.7	289 14.7	S10 27.5	186 49.8	S19 54.8	31 32.8	N22 24.8	66 15.9	N20 32.0
07	153 31.2	304 14.2	28.6	201 50.4	54.2	46 35.3	24.8	81 18.6	32.0
V 08	168 33.6	319 13.7	29.8	216 51.1	53.7	61 37.8	24.9	96 21.2	32.0
I 09	183 36.1	334 13.2 . .	30.9	231 51.8 . .	53.2	76 40.3 . .	24.9	111 23.8 . .	32.0
E 10	198 38.6	349 12.7	32.0	246 52.5	52.7	91 42.9	24.9	126 26.5	31.9
R 11	213 41.0	4 12.2	33.1	261 53.2	52.1	106 45.4	24.9	141 29.1	31.9
N 12	228 43.5	19 11.7	S10 34.3	276 53.8	S19 51.6	121 47.9	N22 24.9	156 31.8	N20 31.9
E 13	243 46.0	34 11.2	35.4	291 54.5	51.1	136 50.4	24.9	171 34.4	31.9
S 14	258 48.4	49 10.7	36.5	306 55.2	50.5	151 53.0	24.9	186 37.1	31.8
15	273 50.9	64 10.2 . .	37.6	321 55.9 . .	50.0	166 55.5 . .	24.9	201 39.7 . .	31.8
16	288 53.3	79 09.7	38.8	336 56.6	49.5	181 58.0	24.9	216 42.4	31.8
17	303 55.8	94 09.2	39.9	351 57.2	49.0	197 00.5	25.0	231 45.0	31.8
18	318 58.3	109 08.6	S10 41.0	6 57.9	S19 48.4	212 03.1	N22 25.0	246 47.7	N20 31.8
19	334 00.7	124 08.1	42.1	21 58.6	47.9	227 05.6	25.0	261 50.3	31.7
20	349 03.2	139 07.6	43.3	36 59.3	47.4	242 08.1	25.0	276 53.0	31.7
21	4 05.7	154 07.1 . .	44.4	52 00.0 . .	46.9	257 10.7 . .	25.0	291 55.6 . .	31.7
22	19 08.1	169 06.6	45.5	67 00.6	46.3	272 13.2	25.0	306 58.3	31.7
23	34 10.6	184 06.1	46.6	82 01.3	45.8	287 15.7	25.0	322 00.9	31.7
10 00	49 13.1	199 05.6	S10 47.7	97 02.0	S19 45.3	302 18.2	N22 25.0	337 03.5	N20 31.6
01	64 15.5	214 05.1	48.9	112 02.7	44.7	317 20.8	25.0	352 06.2	31.6
02	79 18.0	229 04.6	50.0	127 03.4	44.2	332 23.3	25.1	7 08.8	31.6
03	94 20.5	244 04.0 . .	51.1	142 04.0 . .	43.7	347 25.8 . .	25.1	22 11.5 . .	31.6
04	109 22.9	259 03.5	52.2	157 04.7	43.1	2 28.4	25.1	37 14.1	31.5
05	124 25.4	274 03.0	53.3	172 05.4	42.6	17 30.9	25.1	52 16.8	31.5
06	139 27.8	289 02.5	S10 54.5	187 06.1	S19 42.1	32 33.4	N22 25.1	67 19.4	N20 31.5
S 07	154 30.3	304 02.0	55.6	202 06.8	41.5	47 36.0	25.1	82 22.1	31.5
A 08	169 32.8	319 01.5	56.7	217 07.4	41.0	62 38.5	25.1	97 24.7	31.5
B 09	184 35.2	334 01.0 . .	57.8	232 08.1 . .	40.5	77 41.0 . .	25.1	112 27.4 . .	31.4
10	199 37.7	349 00.5	10 58.9	247 08.8	39.9	92 43.6	25.2	127 30.0	31.4
A 11	214 40.2	3 59.9	11 00.1	262 09.5	39.4	107 46.1	25.2	142 32.7	31.4
A 12	229 42.6	18 59.4	S11 01.2	277 10.2	S19 38.9	122 48.6	N22 25.2	157 35.3	N20 31.4
D 13	244 45.1	33 58.9	02.3	292 10.8	38.3	137 51.2	25.2	172 38.0	31.3
14	259 47.6	48 58.4	03.4	307 11.5	37.8	152 53.7	25.2	187 40.6	31.3
15	274 50.0	63 57.9 . .	04.5	322 12.2 . .	37.3	167 56.2 . .	25.2	202 43.3 . .	31.3
O 16	289 52.5	78 57.4	05.6	337 12.9	36.7	182 58.8	25.2	217 45.9	31.3
17	304 54.9	93 56.8	06.7	352 13.6	36.2	198 01.3	25.2	232 48.6	31.3
18	319 57.4	108 56.3	S11 07.9	7 14.2	S19 35.7	213 03.8	N22 25.3	247 51.2	N20 31.2
19	334 59.9	123 55.8	09.0	22 14.9	35.1	228 06.4	25.3	262 53.9	31.2
20	350 02.3	138 55.3	10.1	37 15.6	34.6	243 08.9	25.3	277 56.5	31.2
21	5 04.8	153 54.8 . .	11.2	52 16.3 . .	34.1	258 11.4 . .	25.3	292 59.2 . .	31.2
22	20 07.3	168 54.2	12.3	67 17.0	33.5	273 14.0	25.3	308 01.8	31.1
23	35 09.7	183 53.7	13.4	82 17.6	33.0	288 16.5	25.3	323 04.5	31.1
11 00	50 12.2	198 53.2	S11 14.5	97 18.3	S19 32.5	303 19.1	N22 25.3	338 07.1	N20 31.1
01	65 14.7	213 52.7	15.6	112 19.0	31.9	318 21.6	25.3	353 09.8	31.1
02	80 17.1	228 52.2	16.8	127 19.7	31.4	333 24.1	25.4	8 12.4	31.1
03	95 19.6	243 51.6 . .	17.9	142 20.4 . .	30.8	348 26.7 . .	25.4	23 15.1 . .	31.0
04	110 22.1	258 51.1	19.0	157 21.0	30.3	3 29.2	25.4	38 17.7	31.0
05	125 24.5	273 50.6	20.1	172 21.7	29.8	18 31.8	25.4	53 20.4	31.0
06	140 27.0	288 50.1	S11 21.2	187 22.4	S19 29.2	33 34.3	N22 25.4	68 23.0	N20 31.0
D 07	155 29.4	303 49.5	22.3	202 23.1	28.7	48 36.8	25.4	83 25.7	30.9
O 08	170 31.9	318 49.0	23.4	217 23.8	28.2	63 39.4	25.4	98 28.3	30.9
M 09	185 34.4	333 48.5 . .	24.5	232 24.4 . .	27.6	78 41.9 . .	25.4	113 31.0 . .	30.9
I 10	200 36.8	348 48.0	25.6	247 25.1	27.1	93 44.5	25.5	128 33.6	30.9
N 11	215 39.3	3 47.4	26.7	262 25.8	26.5	108 47.0	25.5	143 36.3	30.9
G 12	230 41.8	18 46.9	S11 27.8	277 26.5	S19 26.0	123 49.6	N22 25.5	158 38.9	N20 30.8
O 13	245 44.2	33 46.4	28.9	292 27.2	25.5	138 52.1	25.5	173 41.6	30.8
14	260 46.7	48 45.9	30.0	307 27.9	24.9	153 54.6	25.5	188 44.2	30.8
15	275 49.2	63 45.3 . .	31.1	322 28.5 . .	24.4	168 57.2 . .	25.5	203 46.9 . .	30.8
16	290 51.6	78 44.8	32.2	337 29.2	23.8	183 59.7	25.5	218 49.6	30.7
17	305 54.1	93 44.3	33.3	352 29.9	23.3	199 02.3	25.5	233 52.2	30.7
18	320 56.6	108 43.8	S11 34.5	7 30.6	S19 22.7	214 04.8	N22 25.6	248 54.9	N20 30.7
19	335 59.0	123 43.2	35.6	22 31.3	22.2	229 07.4	25.6	263 57.5	30.7
20	351 01.5	138 42.7	36.7	37 31.9	21.7	244 09.9	25.6	279 00.2	30.7
21	6 03.9	153 42.2 . .	37.8	52 32.6 . .	21.1	259 12.5 . .	25.6	294 02.8 . .	30.6
22	21 06.4	168 41.6	38.9	67 33.3	20.6	274 15.0	25.6	309 05.5	30.6
23	36 08.9	183 41.1	40.0	82 34.0	20.0	289 17.6	25.6	324 08.1	30.6
	h m								
Pas. Mer.	20 39.7	*v* −0.5	*d* 1.1	*v* 0.7	*d* 0.5	*v* 2.5	*d* 0.0	*v* 2.6	*d* 0.0

ESTRELLAS

Nombre	A.H.S.	Dec.
	° ′	° ′
Acamar	315 24.8	S40 17.9
Achernar	335 32.9	S57 13.8
Acrux	173 20.3	S63 06.2
Adhara	255 19.5	S28 58.2
Aldebaran	290 59.6	N16 30.8
Alioth	166 29.0	N55 57.0
Alkaid	153 06.5	N49 18.3
Al Na'ir	27 55.0	S46 57.4
Alnilam	275 55.4	S 1 12.0
Alphard	218 05.1	S 8 39.8
Alphecca	126 19.1	N26 42.7
Alpheratz	357 52.8	N29 06.1
Altair	62 17.3	N 8 52.5
Ankaa	353 24.3	S42 18.0
Antares	112 37.9	S26 26.1
Arcturus	146 04.4	N19 10.5
Atria	107 48.5	S69 01.9
Avior	234 21.7	S59 30.5
Bellatrix	278 41.5	N 6 21.1
Betelgeuse	271 10.9	N 7 24.5
Canopus	263 59.8	S52 41.5
Capella	280 47.6	N45 59.9
Deneb	49 37.9	N45 17.4
Denebola	182 43.2	N14 33.8
Diphda	349 04.8	S17 58.7
Dubhe	194 03.0	N61 44.3
Elnath	278 23.9	N28 36.5
Eltanin	90 50.8	N51 29.5
Enif	33 56.1	N 9 53.1
Fomalhaut	15 33.9	S29 36.9
Gacrux	172 11.7	S57 07.1
Gienah	176 02.0	S17 32.9
Hadar	149 01.7	S60 22.7
Hamal	328 10.8	N23 28.3
Kaus Aust.	83 56.2	S34 23.1
Kochab	137 20.7	N74 08.9
Markab	13 47.3	N15 13.0
Menkar	314 24.3	N 4 05.8
Menkent	148 18.8	S36 22.5
Miaplacidus	221 41.7	S69 43.1
Mirfak	308 53.0	N49 52.0
Nunki	76 09.9	S26 17.7
Peacock	53 33.7	S56 44.0
Pollux	243 38.7	N28 01.3
Procyon	245 09.2	N 5 13.3
Rasalhague	96 15.2	N12 33.7
Regulus	207 53.3	N11 57.6
Rigel	281 20.6	S 8 11.9
Rigil Kent.	140 05.1	S60 50.3
Sabik	102 23.4	S15 43.6
Schedar	349 50.7	N56 33.0
Shaula	96 34.7	S37 06.3
Sirius	258 41.6	S16 42.9
Spica	158 41.2	S11 10.0
Suhail	222 59.2	S43 26.0
Vega	80 45.4	N38 47.3
Zuben'ubi	137 15.9	S16 02.8

	A.H.S.	Pas. Mer.
	° ′	h m
Venus	149 52.5	10 44
Marte	47 48.9	17 31
Júpiter	253 05.2	3 50
Saturno	287 50.5	1 31

T.U.	SOL				LUNA						
	A.H.G.		Dec.		A.H.G.	v		Dec.		d	P.H.
d h	°	′	°	′	°	′	′	°	′	′	′
9 00	184	03.0	S16	48.7	261	25.5	7.9	N17	51.1	10.2	59.2
01	199	03.0		49.5	275	52.4	7.9	17	40.9	10.2	59.2
02	214	02.9		50.2	290	19.3	8.0	17	30.7	10.3	59.3
03	229	02.9	. .	50.9	304	46.3	8.1	17	20.4	10.5	59.3
04	244	02.8		51.6	319	13.4	8.0	17	09.9	10.5	59.3
05	259	02.7		52.3	333	40.4	8.2	16	59.4	10.7	59.3
06	274	02.7	S16	53.0	348	07.6	8.2	N16	48.7	10.8	59.3
07	289	02.6		53.7	2	34.8	8.2	16	37.9	10.8	59.3
08	304	02.6		54.5	17	02.0	8.3	16	27.1	11.0	59.3
09	319	02.5	. .	55.2	31	29.3	8.4	16	16.1	11.1	59.3
10	334	02.5		55.9	45	56.7	8.4	16	05.0	11.2	59.4
11	349	02.4		56.6	60	24.1	8.4	15	53.8	11.2	59.4
12	4	02.4	S16	57.3	74	51.5	8.5	N15	42.6	11.4	59.4
13	19	02.3		58.0	89	19.0	8.6	15	31.2	11.5	59.4
14	34	02.3		58.7	103	46.6	8.6	15	19.7	11.5	59.4
15	49	02.2	16	59.4	118	14.2	8.7	15	08.2	11.7	59.4
16	64	02.2	17	00.1	132	41.9	8.7	14	56.5	11.7	59.4
17	79	02.1		00.8	147	09.6	8.7	14	44.8	11.9	59.4
18	94	02.0	S17	01.5	161	37.3	8.8	N14	32.9	11.9	59.4
19	109	02.0		02.3	176	05.1	8.9	14	21.0	12.0	59.4
20	124	01.9		03.0	190	33.0	8.8	14	09.0	12.1	59.5
21	139	01.9	. .	03.7	205	00.8	9.0	13	56.9	12.2	59.5
22	154	01.8		04.4	219	28.8	9.0	13	44.7	12.3	59.5
23	169	01.7		05.1	233	56.8	9.0	13	32.4	12.4	59.5
10 00	184	01.7	S17	05.8	248	24.8	9.1	N13	20.0	12.4	59.5
01	199	01.6		06.5	262	52.9	9.1	13	07.6	12.5	59.5
02	214	01.6		07.2	277	21.0	9.2	12	55.1	12.6	59.5
03	229	01.5	. .	07.9	291	49.2	9.2	12	42.5	12.7	59.5
04	244	01.4		08.6	306	17.4	9.3	12	29.8	12.7	59.5
05	259	01.4		09.3	320	45.7	9.3	12	17.1	12.9	59.5
06	274	01.3	S17	10.0	335	14.0	9.4	N12	04.2	12.9	59.6
07	289	01.3		10.7	349	42.4	9.4	11	51.3	13.0	59.6
08	304	01.2		11.4	4	10.8	9.4	11	38.3	13.0	59.6
09	319	01.1	. .	12.1	18	39.2	9.5	11	25.3	13.1	59.6
10	334	01.1		12.8	33	07.7	9.5	11	12.2	13.2	59.6
11	349	01.0		13.5	47	36.2	9.5	10	59.0	13.3	59.6
12	4	01.0	S17	14.2	62	04.7	9.6	N10	45.7	13.3	59.6
13	19	00.9		14.9	76	33.3	9.7	10	32.4	13.3	59.6
14	34	00.8		15.6	91	02.0	9.7	10	19.1	13.5	59.6
15	49	00.8	. .	16.3	105	30.7	9.7	10	05.6	13.5	59.6
16	64	00.7		17.0	119	59.4	9.7	9	52.1	13.6	59.6
17	79	00.6		17.7	134	28.1	9.8	9	38.5	13.6	59.6
18	94	00.6	S17	18.4	148	56.9	9.8	N 9	24.9	13.7	59.6
19	109	00.5		19.1	163	25.7	9.9	9	11.2	13.7	59.6
20	124	00.4		19.8	177	54.6	9.9	8	57.5	13.8	59.6
21	139	00.4	. .	20.5	192	23.5	9.9	8	43.7	13.8	59.7
22	154	00.3		21.2	206	52.4	10.0	8	29.9	13.9	59.7
23	169	00.2		21.9	221	21.4	10.0	8	16.0	14.0	59.7
11 00	184	00.2	S17	22.5	235	50.4	10.0	N 8	02.0	13.9	59.7
01	199	00.1		23.2	250	19.4	10.1	7	48.1	14.1	59.7
02	214	00.0		23.9	264	48.5	10.0	7	34.0	14.1	59.7
03	229	00.0	. .	24.6	279	17.5	10.1	7	19.9	14.1	59.7
04	243	59.9		25.3	293	46.6	10.2	7	05.8	14.2	59.7
05	258	59.8		26.0	308	15.8	10.2	6	51.6	14.2	59.7
06	273	59.7	S17	26.7	322	45.0	10.1	N 6	37.4	14.2	59.7
07	288	59.7		27.4	337	14.1	10.3	6	23.2	14.3	59.7
08	303	59.6		28.1	351	43.4	10.2	6	08.9	14.3	59.7
09	318	59.5	. .	28.8	6	12.6	10.3	5	54.6	14.4	59.7
10	333	59.5		29.4	20	41.9	10.3	5	40.2	14.4	59.7
11	348	59.4		30.1	35	11.2	10.3	5	25.8	14.4	59.7
12	3	59.3	S17	30.8	49	40.5	10.3	N 5	11.4	14.5	59.7
13	18	59.2		31.5	64	09.8	10.4	4	56.9	14.4	59.7
14	33	59.2		32.2	78	39.2	10.3	4	42.5	14.6	59.7
15	48	59.1	. .	32.9	93	08.5	10.4	4	27.9	14.5	59.7
16	63	59.0		33.6	107	37.9	10.4	4	13.4	14.6	59.7
17	78	58.9		34.2	122	07.3	10.5	3	58.8	14.5	59.7
18	93	58.9	S17	34.9	136	36.8	10.4	N 3	44.3	14.7	59.7
19	108	58.8		35.6	151	06.2	10.5	3	29.6	14.6	59.7
20	123	58.7		36.3	165	35.7	10.4	3	15.0	14.6	59.7
21	138	58.6	. .	37.0	180	05.1	10.5	3	00.4	14.7	59.7
22	153	58.6		37.6	194	34.6	10.5	2	45.7	14.7	59.7
23	168	58.5		38.3	209	04.1	10.5	N 2	31.0	14.7	59.7
	SD	16.2	d	0.7	SD	16.2		16.2			16.3

VIERNES — SABADO — DOMINGO

Lat.	Crepúsculo Náutico	Crepúsculo Civil	Orto Sol	Ortc Luna 9	Ortc Luna 10	Ortc Luna 11	Ortc Luna 12
°	h m	h m	h m	h m	h m	h m	h m
N 72	06 41	08 11	10 03	22 11	24 39	00 39	02 55
N 70	06 33	07 52	09 19	22 39	24 52	00 52	02 57
68	06 26	07 37	08 50	23 00	25 01	01 01	02 58
66	06 21	07 25	08 28	23 16	25 09	01 09	03 00
64	06 15	07 14	08 11	23 30	25 16	01 16	03 01
62	06 11	07 05	07 57	23 41	25 22	01 22	03 02
60	06 07	06 58	07 45	23 50	25 27	01 27	03 03
N 58	06 03	06 51	07 35	23 58	25 31	01 31	03 03
56	06 00	06 45	07 26	24 06	00 06	01 35	03 04
54	05 57	06 39	07 18	24 12	00 12	01 39	03 05
52	05 54	06 34	07 11	24 18	00 18	01 42	03 05
50	05 51	06 30	07 05	24 23	00 23	01 45	03 06
45	05 44	06 19	06 51	24 34	00 34	01 51	03 07
N 40	05 38	06 11	06 39	24 43	00 43	01 56	03 08
35	05 33	06 03	06 30	24 51	00 51	02 00	03 09
30	05 27	05 56	06 21	24 58	00 58	02 04	03 09
20	05 17	05 43	06 06	00 08	01 10	02 11	03 11
N 10	05 06	05 31	05 53	00 23	01 20	02 17	03 12
0	04 54	05 19	05 40	00 36	01 30	02 22	03 13
S 10	04 40	05 06	05 28	00 50	01 40	02 28	03 14
20	04 23	04 51	05 14	01 04	01 50	02 33	03 15
30	04 02	04 33	04 59	01 20	02 02	02 40	03 17
35	03 49	04 22	04 50	01 30	02 09	02 44	03 17
40	03 32	04 09	04 39	01 40	02 16	02 48	03 18
45	03 12	03 54	04 27	01 53	02 25	02 53	03 19
S 50	02 44	03 34	04 12	02 08	02 36	02 59	03 20
52	02 30	03 24	04 05	02 15	02 41	03 02	03 21
54	02 14	03 13	03 57	02 23	02 46	03 05	03 22
56	01 53	03 01	03 48	02 32	02 52	03 08	03 22
58	01 26	02 46	03 38	02 42	02 59	03 12	03 23
S 60	00 42	02 29	03 26	02 53	03 06	03 16	03 24

Lat.	Ocaso Sol	Crepúsculo Civil	Crepúsculo Náutico	Ocaso Luna 9	Ocaso Luna 10	Ocaso Luna 11	Ocaso Luna 12
°	h m	h m	h m	h m	h m	h m	h m
N 72	13 24	15 16	16 45	16 45	16 07	15 40	15 16
N 70	14 08	15 35	16 53	16 15	15 52	15 35	15 19
68	14 37	15 50	17 00	15 52	15 40	15 30	15 20
66	14 58	16 02	17 06	15 35	15 30	15 26	15 22
64	15 16	16 13	17 11	15 20	15 22	15 23	15 23
62	15 30	16 21	17 16	15 08	15 15	15 20	15 24
60	15 42	16 29	17 20	14 57	15 09	15 17	15 25
N 58	15 52	16 36	17 24	14 48	15 03	15 15	15 26
56	16 01	16 42	17 27	14 40	14 58	15 13	15 27
54	16 09	16 48	17 31	14 33	14 54	15 11	15 28
52	16 16	16 53	17 34	14 26	14 49	15 09	15 28
50	16 23	16 58	17 37	14 21	14 46	15 08	15 29
45	16 37	17 08	17 43	14 08	14 38	15 05	15 30
N 40	16 48	17 17	17 49	13 57	14 31	15 02	15 31
35	16 58	17 25	17 55	13 48	14 25	14 59	15 32
30	17 07	17 32	18 00	13 40	14 20	14 57	15 33
20	17 22	17 45	18 11	13 26	14 11	14 53	15 34
N 10	17 35	17 57	18 22	13 14	14 03	14 50	15 36
0	17 47	18 09	18 34	13 02	13 55	14 46	15 37
S 10	18 00	18 22	18 48	12 50	13 47	14 43	15 38
20	18 14	18 37	19 05	12 38	13 39	14 39	15 39
30	18 30	18 55	19 26	12 23	13 30	14 35	15 40
35	18 39	19 06	19 40	12 15	13 24	14 33	15 41
40	18 49	19 19	19 56	12 05	13 18	14 30	15 42
45	19 02	19 35	20 17	11 54	13 10	14 27	15 43
S 50	19 17	19 55	20 45	11 40	13 02	14 23	15 44
52	19 24	20 05	21 00	11 34	12 57	14 21	15 45
54	19 32	20 16	21 17	11 26	12 53	14 19	15 45
56	19 41	20 29	21 38	11 18	12 48	14 17	15 46
58	19 51	20 44	22 07	11 09	12 42	14 15	15 47
S 60	20 03	21 02	22 55	10 59	12 36	14 12	15 48

Día	SOL E.T. (+) 00h	SOL E.T. (+) 12h	SOL Pas. Mer.	LUNA Pas. Sup.	LUNA Mer. Inf.	LUNA Edad	LUNA Fase
d	m s	m s	h m	h m	h m	d	%
9	16 12	16 10	11 44	06 49	19 16	24	39
10	16 07	16 04	11 44	07 43	20 09	25	28
11	16 01	15 57	11 44	08 34	21 00	26	18

T.U.	ARIES	VENUS −3.9		MARTE +0.2		JUPITER −2.5		SATURNO −0.3	
d h	A.H.G.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.
	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
12 00	51 11.3	198 40.6	S11 41.1	97 34.7	S19 19.5	304 20.1	N22 25.6	339 10.8	N20 30.6
01	66 13.8	213 40.0	42.2	112 35.4	18.9	319 22.6	25.7	354 13.4	30.5
02	81 16.3	228 39.5	43.3	127 36.0	18.4	334 25.2	25.7	9 16.1	30.5
03	96 18.7	243 39.0 . .	44.4	142 36.7 . .	17.9	349 27.7 . .	25.7	24 18.7 . .	30.5
04	111 21.2	258 38.5	45.5	157 37.4	17.3	4 30.3	25.7	39 21.4	30.5
05	126 23.7	273 37.9	46.5	172 38.1	16.8	19 32.8	25.7	54 24.0	30.5
06	141 26.1	288 37.4	S11 47.6	187 38.8	S19 16.2	34 35.4	N22 25.7	69 26.7	N20 30.4
07	156 28.6	303 36.9	48.7	202 39.4	15.7	49 37.9	25.7	84 29.3	30.4
L 08	171 31.0	318 36.3	49.8	217 40.1	15.1	64 40.5	25.8	99 32.0	30.4
09	186 33.5	333 35.8 . .	50.9	232 40.8 . .	14.6	79 43.0 . .	25.8	114 34.7 . .	30.4
U 10	201 36.0	348 35.2	52.0	247 41.5	14.0	94 45.6	25.8	129 37.3	30.3
11	216 38.4	3 34.7	53.1	262 42.2	13.5	109 48.1	25.8	144 40.0	30.3
N 12	231 40.9	18 34.2	S11 54.2	277 42.9	S19 12.9	124 50.7	N22 25.8	159 42.6	N20 30.3
E 13	246 43.4	33 33.6	55.3	292 43.5	12.4	139 53.2	25.8	174 45.3	30.3
14	261 45.8	48 33.1	56.4	307 44.2	11.8	154 55.8	25.8	189 47.9	30.3
S 15	276 48.3	63 32.6 . .	57.5	322 44.9 . .	11.3	169 58.4 . .	25.9	204 50.6 . .	30.2
16	291 50.8	78 32.0	58.6	337 45.6	10.7	185 00.9	25.9	219 53.2	30.2
17	306 53.2	93 31.5	11 59.7	352 46.3	10.2	200 03.5	25.9	234 55.9	30.2
18	321 55.7	108 31.0	S12 00.8	7 47.0	S19 09.6	215 06.0	N22 25.9	249 58.5	N20 30.2
19	336 58.2	123 30.4	01.9	22 47.6	09.1	230 08.6	25.9	265 01.2	30.1
20	352 00.6	138 29.9	03.0	37 48.3	08.5	245 11.1	25.9	280 03.9	30.1
21	7 03.1	153 29.3 . .	04.0	52 49.0 . .	08.0	260 13.7 . .	25.9	295 06.5 . .	30.1
22	22 05.5	168 28.8	05.1	67 49.7	07.4	275 16.2	26.0	310 09.2	30.1
23	37 08.0	183 28.3	06.2	82 50.4	06.9	290 18.8	26.0	325 11.8	30.0
13 00	52 10.5	198 27.7	S12 07.3	97 51.1	S19 06.3	305 21.3	N22 26.0	340 14.5	N20 30.0
01	67 12.9	213 27.2	08.4	112 51.7	05.8	320 23.9	26.0	355 17.1	30.0
02	82 15.4	228 26.6	09.5	127 52.4	05.2	335 26.5	26.0	10 19.8	30.0
03	97 17.9	243 26.1 . .	10.6	142 53.1 . .	04.7	350 29.0 . .	26.0	25 22.4 . .	30.0
04	112 20.3	258 25.5	11.7	157 53.8	04.1	5 31.6	26.0	40 25.1	29.9
05	127 22.8	273 25.0	12.7	172 54.5	03.6	20 34.1	26.1	55 27.8	29.9
06	142 25.3	288 24.5	S12 13.8	187 55.2	S19 03.0	35 36.7	N22 26.1	70 30.4	N20 29.9
07	157 27.7	303 23.9	14.9	202 55.8	02.5	50 39.3	26.1	85 33.1	29.9
M 08	172 30.2	318 23.4	16.0	217 56.5	01.9	65 41.8	26.1	100 35.7	29.8
A 09	187 32.6	333 22.8 . .	17.1	232 57.2 . .	01.4	80 44.4 . .	26.1	115 38.4 . .	29.8
10	202 35.1	348 22.3	18.2	247 57.9	00.8	95 46.9	26.1	130 41.0	29.8
R 11	217 37.6	3 21.7	19.2	262 58.6	19 00.3	110 49.5	26.1	145 43.7	29.8
T 12	232 40.0	18 21.2	S12 20.3	277 59.3	S18 59.7	125 52.1	N22 26.2	160 46.4	N20 29.8
13	247 42.5	33 20.6	21.4	292 59.9	59.2	140 54.6	26.2	175 49.0	29.7
E 14	262 45.0	48 20.1	22.5	308 00.6	58.6	155 57.2	26.2	190 51.7	29.7
15	277 47.4	63 19.6 . .	23.6	323 01.3 . .	58.0	170 59.7 . .	26.2	205 54.3 . .	29.7
S 16	292 49.9	78 19.0	24.7	338 02.0	57.5	186 02.3	26.2	220 57.0	29.7
17	307 52.4	93 18.5	25.7	353 02.7	56.9	201 04.9	26.2	235 59.6	29.6
18	322 54.8	108 17.9	S12 26.8	8 03.4	S18 56.4	216 07.4	N22 26.3	251 02.3	N20 29.6
19	337 57.3	123 17.4	27.9	23 04.0	55.8	231 10.0	26.3	266 05.0	29.6
20	352 59.8	138 16.8	29.0	38 04.7	55.3	246 12.6	26.3	281 07.6	29.6
21	8 02.2	153 16.3 . .	30.0	53 05.4 . .	54.7	261 15.1 . .	26.3	296 10.3 . .	29.5
22	23 04.7	168 15.7	31.1	68 06.1	54.2	276 17.7	26.3	311 12.9	29.5
23	38 07.1	183 15.2	32.2	83 06.8	53.6	291 20.2	26.3	326 15.6	29.5
14 00	53 09.6	198 14.6	S12 33.3	98 07.5	S18 53.0	306 22.8	N22 26.3	341 18.2	N20 29.5
01	68 12.1	213 14.1	34.3	113 08.2	52.5	321 25.4	26.4	356 20.9	29.5
02	83 14.5	228 13.5	35.4	128 08.8	51.9	336 27.9	26.4	11 23.6	29.4
03	98 17.0	243 12.9 . .	36.5	143 09.5 . .	51.4	351 30.5 . .	26.4	26 26.2 . .	29.4
04	113 19.5	258 12.4	37.6	158 10.2	50.8	6 33.1	26.4	41 28.9	29.4
05	128 21.9	273 11.8	38.6	173 10.9	50.2	21 35.6	26.4	56 31.5	29.4
06	143 24.4	288 11.3	S12 39.7	188 11.6	S18 49.7	36 38.2	N22 26.4	71 34.2	N20 29.3
M 07	158 26.9	303 10.7	40.8	203 12.3	49.1	51 40.8	26.5	86 36.9	29.3
I 08	173 29.3	318 10.2	41.9	218 12.9	48.6	66 43.3	26.5	101 39.5	29.3
E 09	188 31.8	333 09.6 . .	42.9	233 13.6 . .	48.0	81 45.9 . .	26.5	116 42.2 . .	29.3
R 10	203 34.3	348 09.1	44.0	248 14.3	47.4	96 48.5	26.5	131 44.8	29.2
C 11	218 36.7	3 08.5	45.1	263 15.0	46.9	111 51.1	26.5	146 47.5	29.2
O 12	233 39.2	18 08.0	S12 46.1	278 15.7	S18 46.3	126 53.6	N22 26.5	161 50.1	N20 29.2
L 13	248 41.6	33 07.4	47.2	293 16.4	45.8	141 56.2	26.6	176 52.8	29.2
E 14	263 44.1	48 06.8	48.3	308 17.1	45.2	156 58.8	26.6	191 55.5	29.2
S 15	278 46.6	63 06.3 . .	49.4	323 17.7 . .	44.6	172 01.3 . .	26.6	206 58.1 . .	29.1
16	293 49.0	78 05.7	50.4	338 18.4	44.1	187 03.9	26.6	222 00.8	29.1
17	308 51.5	93 05.2	51.5	353 19.1	43.5	202 06.5	26.6	237 03.4	29.1
18	323 54.0	108 04.6	S12 52.6	8 19.8	S18 42.9	217 09.1	N22 26.6	252 06.1	N20 29.1
19	338 56.4	123 04.0	53.6	23 20.5	42.4	232 11.6	26.6	267 08.8	29.0
20	353 58.9	138 03.5	54.7	38 21.2	41.8	247 14.2	26.7	282 11.4	29.0
21	9 01.4	153 02.9 . .	55.7	53 21.9 . .	41.3	262 16.8 . .	26.7	297 14.1 . .	29.0
22	24 03.8	168 02.4	56.8	68 22.5	40.7	277 19.3	26.7	312 16.7	29.0
23	39 06.3	183 01.8	57.9	83 23.2	40.1	292 21.9	26.7	327 19.4	28.9
	h m								
Pas. Mer.	20 27.9	v −0.5	d 1.1	v 0.7	d 0.6	v 2.6	d 0.0	v 2.7	d 0.0

ESTRELLAS		
Nombre	A.H.S.	Dec.
	° ′	° ′
Acamar	315 24.8	S40 17.9
Achernar	335 32.9	S57 13.8
Acrux	173 20.2	S63 06.2
Adhara	255 19.5	S28 58.2
Aldebaran	290 59.6	N16 30.8
Alioth	166 29.0	N55 57.0
Alkaid	153 06.5	N49 18.3
Al Na'ir	27 55.0	S46 57.4
Alnilam	275 55.4	S 1 12.0
Alphard	218 05.1	S 8 39.8
Alphecca	126 19.1	N26 42.7
Alpheratz	357 52.8	N29 06.1
Altair	62 17.3	N 8 52.5
Ankaa	353 24.3	S42 18.0
Antares	112 37.9	S26 26.1
Arcturus	146 04.4	N19 10.5
Atria	107 48.5	S69 01.9
Avior	234 21.6	S59 30.5
Bellatrix	278 41.5	N 6 21.1
Betelgeuse	271 10.9	N 7 24.5
Canopus	263 59.8	S52 41.6
Capella	280 47.6	N45 59.9
Deneb	49 37.9	N45 17.4
Denebola	182 43.2	N14 33.8
Diphda	349 04.8	S17 58.7
Dubhe	194 03.0	N61 44.3
Elnath	278 23.9	N28 36.5
Eltanin	90 50.8	N51 29.5
Enif	33 56.1	N 9 53.1
Fomalhaut	15 33.9	S29 36.9
Gacrux	172 11.7	S57 07.0
Gienah	176 02.0	S17 32.9
Hadar	149 01.7	S60 22.7
Hamal	328 10.8	N23 28.3
Kaus Aust.	83 56.2	S34 23.1
Kochab	137 20.7	N74 08.9
Markab	13 47.3	N15 13.0
Menkar	314 24.3	N 4 05.8
Menkent	148 18.8	S36 22.5
Miaplacidus	221 41.7	S69 43.1
Mirfak	308 53.0	N49 52.1
Nunki	76 09.9	S26 17.7
Peacock	53 33.7	S56 44.0
Pollux	243 38.7	N28 01.3
Procyon	245 09.1	N 5 13.3
Rasalhague	96 15.2	N12 33.7
Regulus	207 53.3	N11 57.6
Rigel	281 20.5	S 8 11.9
Rigil Kent.	140 05.1	S60 50.3
Sabik	102 23.4	S15 43.6
Schedar	349 50.7	N56 33.0
Shaula	96 34.7	S37 06.3
Sirius	258 41.6	S16 42.9
Spica	158 41.2	S11 10.0
Suhail	222 59.2	S43 26.0
Vega	80 45.5	N38 47.3
Zuben'ubi	137 15.9	S16 02.8

	A.H.S.	Pas. Mer.
	° ′	h m
Venus	146 17.2	10 47
Marte	45 40.6	17 28
Júpiter	253 10.9	3 38
Saturno	288 04.0	1 19

T.U.	SOL				LUNA						
	A.H.G.		Dec.		A.H.G.	v		Dec.		d	P.H.
d h	°	′	°	′	°	′	′	°	′	′	′
12 00	183	58.4	S17	39.0	223	33.6	10.6	N 2	16.3	14.7	59.7
01	198	58.3		39.7	238	03.2	10.5	2	01.6	14.7	59.7
02	213	58.3		40.4	252	32.7	10.5	1	46.9	14.7	59.7
03	228	58.2	. .	41.0	267	02.2	10.6	1	32.2	14.8	59.7
04	243	58.1		41.7	281	31.8	10.5	1	17.4	14.7	59.7
05	258	58.0		42.4	296	01.3	10.6	1	02.7	14.8	59.7
06	273	57.9	S17	43.1	310	30.9	10.6	N 0	47.9	14.7	59.7
07	288	57.9		43.7	325	00.5	10.5	0	33.2	14.8	59.7
L 08	303	57.8		44.4	339	30.0	10.6	0	18.4	14.7	59.7
09	318	57.7	. .	45.1	353	59.6	10.6	N 0	03.7	14.8	59.7
U 10	333	57.6		45.8	8	29.2	10.6	S 0	11.1	14.8	59.7
11	348	57.5		46.4	22	58.8	10.6	0	25.9	14.7	59.7
N 12	3	57.5	S17	47.1	37	28.4	10.5	S 0	40.6	14.8	59.7
E 13	18	57.4		47.8	51	57.9	10.6	0	55.4	14.7	59.7
14	33	57.3		48.5	66	27.5	10.6	1	10.1	14.7	59.6
S 15	48	57.2	. .	49.1	80	57.1	10.6	1	24.8	14.7	59.6
16	63	57.1		49.8	95	26.7	10.6	1	39.5	14.8	59.6
17	78	57.0		50.5	109	56.3	10.5	1	54.3	14.7	59.6
18	93	57.0	S17	51.2	124	25.8	10.6	S 2	09.0	14.6	59.6
19	108	56.9		51.8	138	55.4	10.5	2	23.6	14.7	59.6
20	123	56.8		52.5	153	24.9	10.6	2	38.3	14.7	59.6
21	138	56.7	. .	53.2	167	54.5	10.5	2	53.0	14.6	59.6
22	153	56.6		53.8	182	24.0	10.6	3	07.6	14.6	59.6
23	168	56.5		54.5	196	53.6	10.5	3	22.2	14.6	59.6
13 00	183	56.4	S17	55.2	211	23.1	10.5	S 3	36.8	14.6	59.6
01	198	56.4		55.8	225	52.6	10.5	3	51.4	14.5	59.6
02	213	56.3		56.5	240	22.1	10.5	4	05.9	14.5	59.6
03	228	56.2	. .	57.2	254	51.6	10.5	4	20.4	14.5	59.5
04	243	56.1		57.8	269	21.1	10.5	4	34.9	14.5	59.5
05	258	56.0		58.5	283	50.6	10.5	4	49.4	14.4	59.5
06	273	55.9	S17	59.2	298	20.1	10.4	S 5	03.8	14.4	59.5
07	288	55.8	17	59.8	312	49.5	10.4	5	18.2	14.4	59.5
M 08	303	55.7	18	00.5	327	18.9	10.4	5	32.6	14.3	59.5
A 09	318	55.6	. .	01.1	341	48.3	10.4	5	46.9	14.3	59.5
R 10	333	55.6		01.8	356	17.7	10.4	6	01.2	14.3	59.5
11	348	55.5		02.5	10	47.1	10.4	6	15.5	14.2	59.5
T 12	3	55.4	S18	03.1	25	16.5	10.3	S 6	29.7	14.2	59.4
13	18	55.3		03.8	39	45.8	10.4	6	43.9	14.1	59.4
E 14	33	55.2		04.4	54	15.2	10.3	6	58.0	14.1	59.4
S 15	48	55.1	. .	05.1	68	44.5	10.2	7	12.1	14.0	59.4
16	63	55.0		05.8	83	13.7	10.3	7	26.1	14.0	59.4
17	78	54.9		06.4	97	43.0	10.2	7	40.1	14.0	59.4
18	93	54.8	S18	07.1	112	12.2	10.3	S 7	54.1	13.9	59.4
19	108	54.7		07.7	126	41.5	10.1	8	08.0	13.8	59.3
20	123	54.6		08.4	141	10.6	10.2	8	21.8	13.8	59.3
21	138	54.5	. .	09.0	155	39.8	10.2	8	35.6	13.8	59.3
22	153	54.5		09.7	170	09.0	10.1	8	49.4	13.7	59.3
23	168	54.4		10.4	184	38.1	10.1	9	03.1	13.6	59.3
14 00	183	54.3	S18	11.0	199	07.2	10.0	S 9	16.7	13.6	59.3
01	198	54.2		11.7	213	36.2	10.1	9	30.3	13.5	59.2
02	213	54.1		12.3	228	05.3	10.0	9	43.8	13.4	59.2
03	228	54.0	. .	13.0	242	34.3	10.0	9	57.2	13.4	59.2
04	243	53.9		13.6	257	03.3	10.0	10	10.6	13.3	59.2
05	258	53.8		14.3	271	32.3	9.9	10	23.9	13.3	59.2
06	273	53.7	S18	14.9	286	01.2	9.9	S10	37.2	13.2	59.2
M 07	288	53.6		15.6	300	30.1	9.9	10	50.4	13.1	59.1
I 08	303	53.5		16.2	314	59.0	9.8	11	03.5	13.1	59.1
E 09	318	53.4	. .	16.9	329	27.8	9.8	11	16.6	13.0	59.1
R 10	333	53.3		17.5	343	56.6	9.8	11	29.6	12.9	59.1
11	348	53.2		18.2	358	25.4	9.8	11	42.5	12.8	59.1
C 12	3	53.1	S18	18.8	12	54.2	9.7	S11	55.3	12.8	59.0
O 13	18	53.0		19.5	27	22.9	9.7	12	08.1	12.7	59.0
L 14	33	52.9		20.1	41	51.6	9.6	12	20.8	12.6	59.0
E 15	48	52.8	. .	20.8	56	20.2	9.6	12	33.4	12.5	59.0
S 16	63	52.7		21.4	70	48.8	9.6	12	45.9	12.4	59.0
17	78	52.6		22.0	85	17.4	9.6	12	58.3	12.4	58.9
18	93	52.5	S18	22.7	99	46.0	9.5	S13	10.7	12.3	58.9
19	108	52.4		23.3	114	14.5	9.5	13	23.0	12.2	58.9
20	123	52.3		24.0	128	43.0	9.5	13	35.2	12.1	58.9
21	138	52.2	. .	24.6	143	11.5	9.4	13	47.3	12.1	58.9
22	153	52.1		25.3	157	39.9	9.4	13	59.4	11.9	58.8
23	168	52.0		25.9	172	08.3	9.4	S14	11.3	11.9	58.8
	SD	16.2	d	0.7	SD	16.3		16.2			16.1

Lat.	Crepúsculo Náutico	Crepúsculo Civil	Orto Sol	Orto Luna 12	Orto Luna 13	Orto Luna 14	Orto Luna 15
°	h m	h m	h m	h m	h m	h m	h m
N 72	06 52	08 25	10 33	02 55	05 08	07 27	10 17
N 70	06 43	08 04	09 37	02 57	05 00	07 08	09 28
68	06 35	07 47	09 04	02 58	04 54	06 52	08 57
66	06 29	07 34	08 40	03 00	04 49	06 40	08 34
64	06 23	07 22	08 21	03 01	04 45	06 30	08 16
62	06 18	07 13	08 06	03 02	04 41	06 21	08 02
60	06 13	07 04	07 53	03 03	04 38	06 14	07 50
N 58	06 09	06 57	07 42	03 03	04 35	06 07	07 39
56	06 05	06 51	07 32	03 04	04 33	06 02	07 30
54	06 01	06 45	07 24	03 05	04 31	05 57	07 22
52	05 58	06 39	07 16	03 05	04 29	05 52	07 15
50	05 55	06 34	07 10	03 06	04 27	05 48	07 08
45	05 48	06 23	06 55	03 07	04 23	05 39	06 54
N 40	05 41	06 14	06 43	03 08	04 20	05 32	06 43
35	05 35	06 06	06 32	03 09	04 17	05 25	06 33
30	05 29	05 58	06 23	03 09	04 15	05 20	06 25
20	05 18	05 45	06 08	03 11	04 10	05 10	06 11
N 10	05 06	05 32	05 54	03 12	04 07	05 02	05 58
0	04 54	05 19	05 41	03 13	04 03	04 54	05 46
S 10	04 39	05 05	05 28	03 14	04 00	04 47	05 35
20	04 22	04 50	05 13	03 15	03 56	04 39	05 23
30	04 00	04 31	04 57	03 17	03 53	04 29	05 09
35	03 46	04 20	04 47	03 17	03 50	04 24	05 01
40	03 29	04 06	04 36	03 18	03 48	04 18	04 51
45	03 07	03 50	04 23	03 19	03 45	04 12	04 41
S 50	02 38	03 29	04 07	03 20	03 41	04 03	04 28
52	02 23	03 19	04 00	03 21	03 40	04 00	04 22
54	02 05	03 07	03 52	03 22	03 38	03 56	04 16
56	01 42	02 54	03 42	03 22	03 36	03 51	04 09
58	01 10	02 38	03 31	03 23	03 34	03 46	04 00
S 60	00 02	02 19	03 19	03 24	03 32	03 40	03 51

Lat.	Ocaso Sol	Crepúsculo Civil	Crepúsculo Náutico	Ocaso Luna 12	Ocaso Luna 13	Ocaso Luna 14	Ocaso Luna 15
°	h m	h m	h m	h m	h m	h m	h m
N 72	12 54	15 02	16 35	15 16	14 52	14 20	13 21
N 70	13 51	15 24	16 44	15 19	15 02	14 42	14 12
68	14 24	15 40	16 52	15 20	15 10	14 59	14 44
66	14 48	15 54	16 59	15 22	15 17	15 13	15 08
64	15 07	16 05	17 05	15 23	15 24	15 24	15 27
62	15 22	16 15	17 10	15 24	15 29	15 34	15 42
60	15 35	16 23	17 15	15 25	15 33	15 43	15 55
N 58	15 46	16 31	17 19	15 26	15 38	15 50	16 07
56	15 56	16 37	17 23	15 27	15 41	15 57	16 16
54	16 04	16 43	17 26	15 28	15 44	16 03	16 25
52	16 12	16 49	17 30	15 28	15 47	16 08	16 33
50	16 19	16 54	17 33	15 29	15 50	16 13	16 40
45	16 33	17 05	17 40	15 30	15 56	16 24	16 55
N 40	16 45	17 14	17 47	15 31	16 01	16 33	17 08
35	16 56	17 23	17 53	15 32	16 05	16 40	17 19
30	17 05	17 30	17 59	15 33	16 09	16 47	17 28
20	17 21	17 44	18 10	15 34	16 16	16 59	17 44
N 10	17 35	17 57	18 22	15 36	16 22	17 09	17 58
0	17 48	18 10	18 35	15 37	16 27	17 19	18 12
S 10	18 01	18 23	18 49	15 38	16 33	17 29	18 25
20	18 15	18 39	19 07	15 39	16 39	17 39	18 39
30	18 32	18 58	19 29	15 40	16 46	17 51	18 56
35	18 42	19 10	19 43	15 41	16 50	17 58	19 06
40	18 53	19 23	20 01	15 42	16 54	18 06	19 17
45	19 06	19 40	20 23	15 43	16 59	18 15	19 30
S 50	19 22	20 01	20 52	15 44	17 05	18 26	19 46
52	19 30	20 11	21 08	15 45	17 08	18 31	19 53
54	19 38	20 23	21 26	15 45	17 11	18 37	20 01
56	19 48	20 37	21 50	15 46	17 15	18 44	20 11
58	19 59	20 53	22 23	15 47	17 19	18 51	20 21
S 60	20 11	21 12	////	15 48	17 23	18 59	20 34

Día	SOL E.T. (+) 00h	SOL E.T. (+) 12h	SOL Pas. Mer.	LUNA Pas. Sup.	LUNA Mer. Inf.	LUNA Edad	LUNA Fase
d	m s	m s	h m	h m	h m	d	%
12	15 54	15 50	11 44	09 25	21 50	27	10
13	15 46	15 42	11 44	10 15	22 41	28	4
14	15 37	15 33	11 44	11 07	23 33	29	1

T.U.	ARIES	VENUS −3.9		MARTE +0.2		JUPITER −2.5		SATURNO −0.4	
	A.H.G.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
15 00	54 08.7	198 01.2	S12 58.9	98 23.9	S18 39.6	307 24.5	N22 26.7	342 22.1	N20 28.9
01	69 11.2	213 00.7	13 00.0	113 24.6	39.0	322 27.1	26.7	357 24.7	28.9
02	84 13.7	228 00.1	01.1	128 25.3	38.4	337 29.6	26.8	12 27.4	28.9
03	99 16.1	242 59.6	02.1	143 26.0	37.9	352 32.2	26.8	27 30.0	28.9
04	114 18.6	257 59.0	03.2	158 26.7	37.3	7 34.8	26.8	42 32.7	28.8
05	129 21.1	272 58.4	04.2	173 27.3	36.7	22 37.4	26.8	57 35.4	28.8
06	144 23.5	287 57.9	S13 05.3	188 28.0	S18 36.2	37 39.9	N22 26.8	72 38.0	N20 28.8
07	159 26.0	302 57.3	06.4	203 28.7	35.6	52 42.5	26.8	87 40.7	28.8
J 08	174 28.5	317 56.7	07.4	218 29.4	35.0	67 45.1	26.9	102 43.4	28.7
U 09	189 30.9	332 56.2	08.5	233 30.1	34.5	82 47.7	26.9	117 46.0	28.7
E 10	204 33.4	347 55.6	09.5	248 30.8	33.9	97 50.3	26.9	132 48.7	28.7
V 11	219 35.9	2 55.0	10.6	263 31.5	33.3	112 52.8	26.9	147 51.3	28.7
12	234 38.3	17 54.5	S13 11.7	278 32.1	S18 32.8	127 55.4	N22 26.9	162 54.0	N20 28.6
E 13	249 40.8	32 53.9	12.7	293 32.8	32.2	142 58.0	26.9	177 56.7	28.6
S 14	264 43.2	47 53.3	13.8	308 33.5	31.6	158 00.6	27.0	192 59.3	28.6
15	279 45.7	62 52.8	14.8	323 34.2	31.1	173 03.1	27.0	208 02.0	28.6
16	294 48.2	77 52.2	15.9	338 34.9	30.5	188 05.7	27.0	223 04.6	28.6
17	309 50.6	92 51.6	16.9	353 35.6	29.9	203 08.3	27.0	238 07.3	28.5
18	324 53.1	107 51.0	S13 18.0	8 36.3	S18 29.4	218 10.9	N22 27.0	253 10.0	N20 28.5
19	339 55.6	122 50.5	19.0	23 37.0	28.8	233 13.5	27.1	268 12.6	28.5
20	354 58.0	137 49.9	20.1	38 37.6	28.2	248 16.1	27.1	283 15.3	28.5
21	10 00.5	152 49.3	21.1	53 38.3	27.6	263 18.6	27.1	298 18.0	28.4
22	25 03.0	167 48.8	22.2	68 39.0	27.1	278 21.2	27.1	313 20.6	28.4
23	40 05.4	182 48.2	23.2	83 39.7	26.5	293 23.8	27.1	328 23.3	28.4
16 00	55 07.9	197 47.6	S13 24.3	98 40.4	S18 25.9	308 26.4	N22 27.1	343 25.9	N20 28.4
01	70 10.4	212 47.0	25.3	113 41.1	25.4	323 29.0	27.2	358 28.6	28.3
02	85 12.8	227 46.5	26.4	128 41.8	24.8	338 31.5	27.2	13 31.3	28.3
03	100 15.3	242 45.9	27.4	143 42.4	24.2	353 34.1	27.2	28 33.9	28.3
04	115 17.7	257 45.3	28.5	158 43.1	23.6	8 36.7	27.2	43 36.6	28.3
05	130 20.2	272 44.7	29.5	173 43.8	23.1	23 39.3	27.2	58 39.3	28.3
06	145 22.7	287 44.2	S13 30.6	188 44.5	S18 22.5	38 41.9	N22 27.2	73 41.9	N20 28.2
07	160 25.1	302 43.6	31.6	203 45.2	21.9	53 44.5	27.3	88 44.6	28.2
V 08	175 27.6	317 43.0	32.7	218 45.9	21.4	68 47.1	27.3	103 47.2	28.2
I 09	190 30.1	332 42.4	33.7	233 46.6	20.8	83 49.6	27.3	118 49.9	28.2
E 10	205 32.5	347 41.9	34.8	248 47.3	20.2	98 52.2	27.3	133 52.6	28.1
R 11	220 35.0	2 41.3	35.8	263 48.0	19.6	113 54.8	27.3	148 55.2	28.1
12	235 37.5	17 40.7	S13 36.8	278 48.6	S18 19.1	128 57.4	N22 27.4	163 57.9	N20 28.1
N 13	250 39.9	32 40.1	37.9	293 49.3	18.5	144 00.0	27.4	179 00.6	28.1
E 14	265 42.4	47 39.5	38.9	308 50.0	17.9	159 02.6	27.4	194 03.2	28.0
S 15	280 44.9	62 39.0	40.0	323 50.7	17.3	174 05.2	27.4	209 05.9	28.0
16	295 47.3	77 38.4	41.0	338 51.4	16.8	189 07.8	27.4	224 08.6	28.0
17	310 49.8	92 37.8	42.1	353 52.1	16.2	204 10.3	27.4	239 11.2	28.0
18	325 52.2	107 37.2	S13 43.1	8 52.8	S18 15.6	219 12.9	N22 27.5	254 13.9	N20 27.9
19	340 54.7	122 36.6	44.1	23 53.5	15.0	234 15.5	27.5	269 16.5	27.9
20	355 57.2	137 36.1	45.2	38 54.1	14.4	249 18.1	27.5	284 19.2	27.9
21	10 59.6	152 35.5	46.2	53 54.8	13.9	264 20.7	27.5	299 21.9	27.9
22	26 02.1	167 34.9	47.2	68 55.5	13.3	279 23.3	27.5	314 24.5	27.9
23	41 04.6	182 34.3	48.3	83 56.2	12.7	294 25.9	27.6	329 27.2	27.8
17 00	56 07.0	197 33.7	S13 49.3	98 56.9	S18 12.1	309 28.5	N22 27.6	344 29.9	N20 27.8
01	71 09.5	212 33.1	50.4	113 57.6	11.6	324 31.1	27.6	359 32.5	27.8
02	86 12.0	227 32.6	51.4	128 58.3	11.0	339 33.7	27.6	14 35.2	27.8
03	101 14.4	242 32.0	52.4	143 59.0	10.4	354 36.3	27.6	29 37.9	27.7
04	116 16.9	257 31.4	53.5	158 59.7	09.8	9 38.9	27.6	44 40.5	27.7
05	131 19.3	272 30.8	54.5	174 00.3	09.2	24 41.4	27.7	59 43.2	27.7
06	146 21.8	287 30.2	S13 55.5	189 01.0	S18 08.7	39 44.0	N22 27.7	74 45.9	N20 27.7
07	161 24.3	302 29.6	56.6	204 01.7	08.1	54 46.6	27.7	89 48.5	27.6
S 08	176 26.7	317 29.0	57.6	219 02.4	07.5	69 49.2	27.7	104 51.2	27.6
A 09	191 29.2	332 28.4	58.6	234 03.1	06.9	84 51.8	27.7	119 53.9	27.6
10	206 31.7	347 27.9	13 59.6	249 03.8	06.3	99 54.4	27.8	134 56.5	27.6
B 11	221 34.1	2 27.3	14 00.7	264 04.5	05.8	114 57.0	27.8	149 59.2	27.6
A 12	236 36.6	17 26.7	S14 01.7	279 05.2	S18 05.2	129 59.6	N22 27.8	165 01.9	N20 27.5
D 13	251 39.1	32 26.1	02.7	294 05.9	04.6	145 02.2	27.8	180 04.5	27.5
14	266 41.5	47 25.5	03.8	309 06.5	04.0	160 04.8	27.8	195 07.2	27.5
15	281 44.0	62 24.9	04.8	324 07.2	03.4	175 07.4	27.8	210 09.8	27.5
O 16	296 46.5	77 24.3	05.8	339 07.9	02.9	190 10.0	27.9	225 12.5	27.4
17	311 48.9	92 23.7	06.8	354 08.6	02.3	205 12.6	27.9	240 15.2	27.4
18	326 51.4	107 23.1	S14 07.9	9 09.3	S18 01.7	220 15.2	N22 27.9	255 17.8	N20 27.4
19	341 53.8	122 22.5	08.9	24 10.0	01.1	235 17.8	27.9	270 20.5	27.4
20	356 56.3	137 21.9	09.9	39 10.7	18 00.5	250 20.4	27.9	285 23.2	27.3
21	11 58.8	152 21.3	10.9	54 11.4	17 59.9	265 23.0	28.0	300 25.8	27.3
22	27 01.2	167 20.8	12.0	69 12.1	59.4	280 25.6	28.0	315 28.5	27.3
23	42 03.7	182 20.2	13.0	84 12.8	58.8	295 28.2	28.0	330 31.2	27.3
Pas. Mer.	h m 20 16.1	v −0.6	d 1.0	v 0.7	d 0.6	v 2.6	d 0.0	v 2.7	d 0.0

ESTRELLAS

Nombre	A.H.S.	Dec.
	° ′	° ′
Acamar	315 24.8	S40 17.9
Achernar	335 32.9	S57 13.9
Acrux	173 20.2	S63 06.2
Adhara	255 19.5	S28 58.3
Aldebaran	290 59.6	N16 30.8
Alioth	166 29.0	N55 57.0
Alkaid	153 06.5	N49 18.3
Al Na'ir	27 55.0	S46 57.4
Alnilam	275 55.4	S 1 12.0
Alphard	218 05.0	S 8 39.8
Alphecca	126 19.1	N26 42.6
Alpheratz	357 52.8	N29 06.1
Altair	62 17.3	N 8 52.5
Ankaa	353 24.3	S42 18.0
Antares	112 37.9	S26 26.1
Arcturus	146 04.4	N19 10.5
Atria	107 48.5	S69 01.9
Avior	234 21.6	S59 30.6
Bellatrix	278 41.5	N 6 21.1
Betelgeuse	271 10.9	N 7 24.5
Canopus	263 59.8	S52 41.6
Capella	280 47.5	N45 59.9
Deneb	49 37.9	N45 17.4
Denebola	182 43.1	N14 33.8
Diphda	349 04.8	S17 58.7
Dubhe	194 02.9	N61 44.3
Elnath	278 23.8	N28 36.5
Eltanin	90 50.8	N51 29.5
Enif	33 56.1	N 9 53.1
Fomalhaut	15 33.9	S29 36.9
Gacrux	172 11.7	S57 07.0
Gienah	176 02.0	S17 32.9
Hadar	149 01.7	S60 22.6
Hamal	328 10.8	N23 28.3
Kaus Aust.	83 56.2	S34 23.1
Kochab	137 20.7	N74 08.9
Markab	13 47.3	N15 13.0
Menkar	314 24.3	N 4 05.8
Menkent	148 18.8	S36 22.5
Miaplacidus	221 41.6	S69 43.1
Mirfak	308 53.0	N49 52.1
Nunki	76 09.9	S26 17.7
Peacock	53 33.7	S56 44.0
Pollux	243 38.7	N28 01.3
Procyon	245 09.1	N 5 13.3
Rasalhague	96 15.2	N12 33.6
Regulus	207 53.3	N11 57.6
Rigel	281 20.5	S 8 11.9
Rigil Kent.	140 05.1	S60 50.3
Sabik	102 23.4	S15 43.6
Schedar	349 50.7	N56 33.0
Shaula	96 34.7	S37 06.3
Sirius	258 41.6	S16 42.9
Spica	158 41.2	S11 10.0
Suhail	222 59.1	S43 26.0
Vega	80 45.5	N38 47.3
Zuben'ubi	137 15.9	S16 02.8

	A.H.S.	Pas. Mer.
	° ′	h m
Venus	142 39.7	10 49
Marte	43 32.5	17 25
Júpiter	253 18.5	3 26
Saturno	288 18.1	1 06

(JUE., VIE., SAB.) 15, 16, 17 NOVIEMBRE DEL 2001

T.U.	SOL				LUNA					
	A.H.G.		Dec.		A.H.G.	v	Dec.	d	P.H.	
d h	°	′	°	′	°	′	°	′	′	′
15 00	183	51.9	S18	26.5	186	36.7	9.3	S14	23.2	11.7	58.8
01	198	51.8		27.2	201	05.0	9.3	14	34.9	11.7	58.8
02	213	51.7		27.8	215	33.3	9.2	14	46.6	11.6	58.7
03	228	51.6	. .	28.5	230	01.5	9.3	14	58.2	11.5	58.7
04	243	51.4		29.1	244	29.8	9.2	15	09.7	11.3	58.7
05	258	51.3		29.7	258	58.0	9.1	15	21.0	11.3	58.7
06	273	51.2	S18	30.4	273	26.1	9.1	S15	32.3	11.2	58.6
07	288	51.1		31.0	287	54.2	9.1	15	43.5	11.1	58.6
J 08	303	51.0		31.6	302	22.3	9.1	15	54.6	11.0	58.6
U 09	318	50.9	. .	32.3	316	50.4	9.0	16	05.6	10.9	58.6
E 10	333	50.8		32.9	331	18.4	9.0	16	16.5	10.8	58.6
11	348	50.7		33.5	345	46.4	8.9	16	27.3	10.7	58.5
V 12	3	50.6	S18	34.2	0	14.3	9.0	S16	38.0	10.6	58.5
13	18	50.5		34.8	14	42.3	8.9	16	48.6	10.5	58.5
E 14	33	50.4		35.4	29	10.2	8.8	16	59.1	10.4	58.4
15	48	50.3	. .	36.1	43	38.0	8.8	17	09.5	10.2	58.4
S 16	63	50.2		36.7	58	05.8	8.8	17	19.7	10.2	58.4
17	78	50.0		37.3	72	33.6	8.8	17	29.9	10.0	58.4
18	93	49.9	S18	38.0	87	01.4	8.7	S17	39.9	10.0	58.3
19	108	49.8		38.6	101	29.1	8.7	17	49.9	9.8	58.3
20	123	49.7		39.2	115	56.8	8.7	17	59.7	9.7	58.3
21	138	49.6	. .	39.9	130	24.5	8.6	18	09.4	9.6	58.3
22	153	49.5		40.5	144	52.1	8.6	18	19.0	9.5	58.2
23	168	49.4		41.1	159	19.7	8.6	18	28.5	9.4	58.2
16 00	183	49.3	S18	41.7	173	47.3	8.5	S18	37.9	9.2	58.2
01	198	49.1		42.4	188	14.8	8.6	18	47.1	9.2	58.1
02	213	49.0		43.0	202	42.4	8.4	18	56.3	9.0	58.1
03	228	48.9	. .	43.6	217	09.8	8.5	19	05.3	8.9	58.1
04	243	48.8		44.2	231	37.3	8.4	19	14.2	8.8	58.1
05	258	48.7		44.9	246	04.7	8.4	19	23.0	8.7	58.0
06	273	48.6	S18	45.5	260	32.1	8.4	S19	31.7	8.5	58.0
07	288	48.5		46.1	274	59.5	8.4	19	40.2	8.4	58.0
V 08	303	48.3		46.7	289	26.9	8.3	19	48.6	8.3	57.9
I 09	318	48.2	. .	47.4	303	54.2	8.3	19	56.9	8.2	57.9
E 10	333	48.1		48.0	318	21.5	8.3	20	05.1	8.0	57.9
R 11	348	48.0		48.6	332	48.8	8.3	20	13.1	8.0	57.9
12	3	47.9	S18	49.2	347	16.1	8.2	S20	21.1	7.8	57.8
N 13	18	47.8		49.8	1	43.3	8.2	20	28.9	7.6	57.8
E 14	33	47.6		50.5	16	10.5	8.2	20	36.5	7.6	57.8
S 15	48	47.5	. .	51.1	30	37.7	8.2	20	44.1	7.4	57.7
16	63	47.4		51.7	45	04.9	8.1	20	51.5	7.3	57.7
17	78	47.3		52.3	59	32.0	8.2	20	58.8	7.1	57.7
18	93	47.2	S18	52.9	73	59.2	8.1	S21	05.9	7.1	57.7
19	108	47.0		53.5	88	26.3	8.1	21	13.0	6.9	57.6
20	123	46.9		54.2	102	53.4	8.1	21	19.9	6.7	57.6
21	138	46.8	. .	54.8	117	20.5	8.1	21	26.6	6.7	57.6
22	153	46.7		55.4	131	47.6	8.0	21	33.3	6.5	57.5
23	168	46.6		56.0	146	14.6	8.1	21	39.8	6.4	57.5
17 00	183	46.4	S18	56.6	160	41.7	8.0	S21	46.2	6.2	57.5
01	198	46.3		57.2	175	08.7	8.0	21	52.4	6.1	57.4
02	213	46.2		57.8	189	35.7	8.0	21	58.5	6.0	57.4
03	228	46.1	. .	58.5	204	02.7	8.0	22	04.5	5.8	57.4
04	243	46.0		59.1	218	29.7	8.0	22	10.3	5.7	57.3
05	258	45.8	18	59.7	232	56.7	8.0	22	16.0	5.6	57.3
06	273	45.7	S19	00.3	247	23.7	8.0	S22	21.6	5.4	57.3
07	288	45.6		00.9	261	50.7	8.0	22	27.0	5.3	57.3
S 08	303	45.5		01.5	276	17.7	8.0	22	32.3	5.2	57.2
A 09	318	45.3	. .	02.1	290	44.7	7.9	22	37.5	5.0	57.2
B 10	333	45.2		02.7	305	11.6	8.0	22	42.5	4.9	57.2
A 11	348	45.1		03.3	319	38.6	8.0	22	47.4	4.8	57.1
D 12	3	45.0	S19	03.9	334	05.6	7.9	S22	52.2	4.6	57.1
13	18	44.8		04.5	348	32.5	8.0	22	56.8	4.5	57.1
O 14	33	44.7		05.1	2	59.5	8.0	23	01.3	4.4	57.0
15	48	44.6	. .	05.7	17	26.5	7.9	23	05.7	4.2	57.0
16	63	44.5		06.3	31	53.4	8.0	23	09.9	4.0	57.0
17	78	44.3		06.9	46	20.4	8.0	23	13.9	4.0	56.9
18	93	44.2	S19	07.5	60	47.4	8.0	S23	17.9	3.8	56.9
19	108	44.1		08.2	75	14.4	8.0	23	21.7	3.7	56.9
20	123	43.9		08.8	89	41.4	8.0	23	25.4	3.5	56.8
21	138	43.8	. .	09.4	104	08.4	8.0	23	28.9	3.4	56.8
22	153	43.7		10.0	118	35.4	8.1	23	32.3	3.2	56.8
23	168	43.6		10.6	133	02.5	8.0	S23	35.5	3.1	56.8
	SD	16.2	d	0.6	SD	15.9		15.8			15.6

Lat.	Crepúsculo Náutico	Crepúsculo Civil	Orto Sol	Orto Luna 15	Orto Luna 16	Orto Luna 17	Orto Luna 18
°	h m	h m	h m	h m	h m	h m	h m
N 72	07 03	08 39	11 34	10 17	▬	▬	▬
N 70	06 53	08 16	09 56	09 28	▬	▬	▬
68	06 44	07 57	09 18	08 57	11 17	▬	▬
66	06 36	07 43	08 51	08 34	10 32	12 36	▬
64	06 30	07 30	08 31	08 16	10 03	11 45	13 08
62	06 24	07 20	08 14	08 02	09 41	11 13	12 28
60	06 19	07 11	08 01	07 50	09 23	10 49	12 01
N 58	06 14	07 03	07 49	07 39	09 08	10 30	11 40
56	06 10	06 56	07 39	07 30	08 56	10 15	11 22
54	06 06	06 50	07 30	07 22	08 45	10 01	11 07
52	06 03	06 44	07 22	07 15	08 35	09 49	10 54
50	05 59	06 39	07 14	07 08	08 26	09 39	10 43
45	05 51	06 27	06 59	06 54	08 08	09 17	10 19
N 40	05 44	06 17	06 46	06 43	07 53	09 00	10 01
35	05 38	06 08	06 35	06 33	07 41	08 45	09 45
30	05 32	06 00	06 26	06 25	07 30	08 32	09 31
20	05 19	05 46	06 09	06 11	07 11	08 11	09 08
N 10	05 07	05 33	05 55	05 58	06 55	07 52	08 48
0	04 54	05 19	05 41	05 46	06 40	07 34	08 29
S 10	04 39	05 05	05 27	05 35	06 25	07 17	08 10
20	04 21	04 49	05 13	05 23	06 09	06 59	07 51
30	03 58	04 29	04 55	05 09	05 51	06 37	07 28
35	03 43	04 17	04 45	05 01	05 41	06 25	07 14
40	03 25	04 03	04 34	04 51	05 29	06 11	06 59
45	03 03	03 46	04 20	04 41	05 15	05 54	06 40
S 50	02 32	03 24	04 03	04 28	04 57	05 33	06 17
52	02 16	03 13	03 55	04 22	04 49	05 23	06 06
54	01 56	03 01	03 47	04 16	04 41	05 12	05 54
56	01 31	02 47	03 37	04 09	04 31	05 00	05 39
58	00 53	02 30	03 25	04 00	04 19	04 46	05 23
S 60	////	02 09	03 12	03 51	04 06	04 29	05 03

Lat.	Ocaso Sol	Crepúsculo Civil	Crepúsculo Náutico	Ocaso Luna 15	Ocaso Luna 16	Ocaso Luna 17	Ocaso Luna 18
°	h m	h m	h m	h m	h m	h m	h m
N 72	11 54	14 49	16 25	13 21	▬	▬	▬
N 70	13 32	15 13	16 36	14 12	▬	▬	▬
68	14 11	15 31	16 45	14 44	14 16	▬	▬
66	14 38	15 46	16 52	15 08	15 02	14 52	▬
64	14 58	15 58	16 59	15 27	15 32	15 44	16 15
62	15 15	16 09	17 05	15 42	15 55	16 16	16 55
60	15 28	16 18	17 10	15 55	16 13	16 40	17 22
N 58	15 40	16 26	17 14	16 07	16 29	17 00	17 44
56	15 50	16 33	17 19	16 16	16 42	17 16	18 01
54	15 59	16 39	17 23	16 25	16 53	17 29	18 16
52	16 07	16 45	17 26	16 33	17 03	17 41	18 29
50	16 15	16 50	17 30	16 40	17 12	17 52	18 40
45	16 30	17 02	17 38	16 55	17 32	18 14	19 04
N 40	16 43	17 12	17 45	17 08	17 47	18 32	19 23
35	16 54	17 21	17 51	17 19	18 01	18 48	19 39
30	17 03	17 29	17 58	17 28	18 12	19 01	19 53
20	17 20	17 43	18 10	17 44	18 32	19 23	20 16
N 10	17 35	17 57	18 22	17 58	18 50	19 43	20 36
0	17 48	18 10	18 36	18 12	19 06	20 01	20 55
S 10	18 02	18 25	18 51	18 25	19 22	20 19	21 14
20	18 17	18 41	19 09	18 39	19 40	20 38	21 34
30	18 35	19 01	19 32	18 56	20 00	21 01	21 57
35	18 45	19 13	19 47	19 06	20 12	21 14	22 11
40	18 56	19 27	20 05	19 17	20 25	21 29	22 27
45	19 10	19 45	20 28	19 30	20 41	21 48	22 46
S 50	19 27	20 07	20 59	19 46	21 01	22 10	23 09
52	19 35	20 18	21 16	19 53	21 11	22 21	23 20
54	19 44	20 30	21 36	20 01	21 21	22 33	23 33
56	19 54	20 44	22 02	20 11	21 34	22 47	23 48
58	20 06	21 02	22 43	20 21	21 48	23 04	24 05
S 60	20 19	21 23	////	20 34	22 04	23 24	24 26

Día	SOL E.T. (+) 00h	SOL E.T. (+) 12h	SOL Pas. Mer.	LUNA Pas. Sup.	LUNA Mer. Inf.	LUNA Edad	LUNA Fase
d	m s	m s	h m	h m	h m	d	%
15	15 28	15 23	11 45	11 59	24 26	00	0
16	15 17	15 12	11 45	12 53	00 26	01	2
17	15 06	15 00	11 45	13 48	01 20	02	6

T.U.	ARIES	VENUS −3.9		MARTE +0.3		JUPITER −2.6		SATURNO −0.4	
	A.H.G.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
18 00	57 06.2	197 19.6	S14 14.0	99 13.5	S17 58.2	310 30.8	N22 28.0	345 33.8	N20 27.2
01	72 08.6	212 19.0	15.0	114 14.1	57.6	325 33.4	28.0	0 36.5	27.2
02	87 11.1	227 18.4	16.0	129 14.8	57.0	340 36.0	28.1	15 39.2	27.2
03	102 13.6	242 17.8 . .	17.1	144 15.5 . .	56.4	355 38.6 . .	28.1	30 41.8 . .	27.2
04	117 16.0	257 17.2	18.1	159 16.2	55.8	10 41.2	28.1	45 44.5	27.2
05	132 18.5	272 16.6	19.1	174 16.9	55.3	25 43.8	28.1	60 47.2	27.1
06	147 21.0	287 16.0	S14 20.1	189 17.6	S17 54.7	40 46.4	N22 28.1	75 49.8	N20 27.1
07	162 23.4	302 15.4	21.1	204 18.3	54.1	55 49.0	28.2	90 52.5	27.1
D 08	177 25.9	317 14.8	22.2	219 19.0	53.5	70 51.6	28.2	105 55.2	27.1
O 09	192 28.3	332 14.2 . .	23.2	234 19.7 . .	52.9	85 54.2 . .	28.2	120 57.8 . .	27.0
M 10	207 30.8	347 13.6	24.2	249 20.4	52.3	100 56.8	28.2	136 00.5	27.0
11	222 33.3	2 13.0	25.2	264 21.1	51.7	115 59.4	28.2	151 03.2	27.0
I 12	237 35.7	17 12.4	S14 26.2	279 21.7	S17 51.2	131 02.0	N22 28.3	166 05.8	N20 27.0
N 13	252 38.2	32 11.8	27.2	294 22.4	50.6	146 04.6	28.3	181 08.5	26.9
G 14	267 40.7	47 11.2	28.2	309 23.1	50.0	161 07.2	28.3	196 11.2	26.9
O 15	282 43.1	62 10.6 . .	29.3	324 23.8 . .	49.4	176 09.8 . .	28.3	211 13.9 . .	26.9
16	297 45.6	77 10.0	30.3	339 24.5	48.8	191 12.4	28.3	226 16.5	26.9
17	312 48.1	92 09.4	31.3	354 25.2	48.2	206 15.1	28.4	241 19.2	26.8
18	327 50.5	107 08.8	S14 32.3	9 25.9	S17 47.6	221 17.7	N22 28.4	256 21.9	N20 26.8
19	342 53.0	122 08.2	33.3	24 26.6	47.0	236 20.3	28.4	271 24.5	26.8
20	357 55.5	137 07.6	34.3	39 27.3	46.4	251 22.9	28.4	286 27.2	26.8
21	12 57.9	152 06.9 . .	35.3	54 28.0 . .	45.9	266 25.5 . .	28.4	301 29.9 . .	26.7
22	28 00.4	167 06.3	36.3	69 28.7	45.3	281 28.1	28.5	316 32.5	26.7
23	43 02.8	182 05.7	37.3	84 29.4	44.7	296 30.7	28.5	331 35.2	26.7
19 00	58 05.3	197 05.1	S14 38.3	99 30.0	S17 44.1	311 33.3	N22 28.5	346 37.9	N20 26.7
01	73 07.8	212 04.5	39.3	114 30.7	43.5	326 35.9	28.5	1 40.5	26.7
02	88 10.2	227 03.9	40.3	129 31.4	42.9	341 38.5	28.5	16 43.2	26.6
03	103 12.7	242 03.3 . .	41.3	144 32.1 . .	42.3	356 41.1 . .	28.6	31 45.9 . .	26.6
04	118 15.2	257 02.7	42.4	159 32.8	41.7	11 43.7	28.6	46 48.5	26.6
05	133 17.6	272 02.1	43.4	174 33.5	41.1	26 46.4	28.6	61 51.2	26.6
06	148 20.1	287 01.5	S14 44.4	189 34.2	S17 40.5	41 49.0	N22 28.6	76 53.9	N20 26.5
07	163 22.6	302 00.9	45.4	204 34.9	39.9	56 51.6	28.6	91 56.5	26.5
L 08	178 25.0	317 00.3	46.4	219 35.6	39.3	71 54.2	28.7	106 59.2	26.5
U 09	193 27.5	331 59.6 . .	47.4	234 36.3 . .	38.8	86 56.8 . .	28.7	122 01.9 . .	26.5
10	208 30.0	346 59.0	48.4	249 37.0	38.2	101 59.4	28.7	137 04.6	26.4
N 11	223 32.4	1 58.4	49.4	264 37.7	37.6	117 02.0	28.7	152 07.2	26.4
12	238 34.9	16 57.8	S14 50.4	279 38.4	S17 37.0	132 04.6	N22 28.7	167 09.9	N20 26.4
E 13	253 37.3	31 57.2	51.4	294 39.1	36.4	147 07.3	28.8	182 12.6	26.4
14	268 39.8	46 56.6	52.4	309 39.7	35.8	162 09.9	28.8	197 15.2	26.3
S 15	283 42.3	61 56.0 . .	53.4	324 40.4 . .	35.2	177 12.5 . .	28.8	212 17.9 . .	26.3
16	298 44.7	76 55.4	54.3	339 41.1	34.6	192 15.1	28.8	227 20.6	26.3
17	313 47.2	91 54.7	55.3	354 41.8	34.0	207 17.7	28.8	242 23.2	26.3
18	328 49.7	106 54.1	S14 56.3	9 42.5	S17 33.4	222 20.3	N22 28.9	257 25.9	N20 26.3
19	343 52.1	121 53.5	57.3	24 43.2	32.8	237 22.9	28.9	272 28.6	26.2
20	358 54.6	136 52.9	58.3	39 43.9	32.2	252 25.6	28.9	287 31.2	26.2
21	13 57.1	151 52.3	14 59.3	54 44.6 . .	31.6	267 28.2 . .	28.9	302 33.9 . .	26.2
22	28 59.5	166 51.7	15 00.3	69 45.3	31.0	282 30.8	29.0	317 36.6	26.2
23	44 02.0	181 51.0	01.3	84 46.0	30.4	297 33.4	29.0	332 39.3	26.1
20 00	59 04.5	196 50.4	S15 02.3	99 46.7	S17 29.8	312 36.0	N22 29.0	347 41.9	N20 26.1
01	74 06.9	211 49.8	03.3	114 47.4	29.2	327 38.7	29.0	2 44.6	26.1
02	89 09.4	226 49.2	04.3	129 48.1	28.6	342 41.3	29.0	17 47.3	26.1
03	104 11.8	241 48.6 . .	05.3	144 48.8 . .	28.0	357 43.9 . .	29.1	32 49.9 . .	26.0
04	119 14.3	256 47.9	06.3	159 49.5	27.4	12 46.5	29.1	47 52.6	26.0
05	134 16.8	271 47.3	07.2	174 50.2	26.8	27 49.1	29.1	62 55.3	26.0
06	149 19.2	286 46.7	S15 08.2	189 50.8	S17 26.2	42 51.7	N22 29.1	77 57.9	N20 26.0
07	164 21.7	301 46.1	09.2	204 51.5	25.6	57 54.4	29.1	93 00.6	25.9
M 08	179 24.2	316 45.4	10.2	219 52.2	25.0	72 57.0	29.2	108 03.3	25.9
A 09	194 26.6	331 44.8 . .	11.2	234 52.9 . .	24.4	87 59.6 . .	29.2	123 06.0 . .	25.9
R 10	209 29.1	346 44.2	12.2	249 53.6	23.8	103 02.2	29.2	138 08.6	25.9
11	224 31.6	1 43.6	13.2	264 54.3	23.2	118 04.8	29.2	153 11.3	25.8
T 12	239 34.0	16 43.0	S15 14.1	279 55.0	S17 22.6	133 07.5	N22 29.2	168 14.0	N20 25.8
13	254 36.5	31 42.3	15.1	294 55.7	22.0	148 10.1	29.3	183 16.6	25.8
E 14	269 38.9	46 41.7	16.1	309 56.4	21.4	163 12.7	29.3	198 19.3	25.8
S 15	284 41.4	61 41.1 . .	17.1	324 57.1 . .	20.8	178 15.3 . .	29.3	213 22.0 . .	25.8
16	299 43.9	76 40.4	18.1	339 57.8	20.2	193 18.0	29.3	228 24.7	25.7
17	314 46.3	91 39.8	19.0	354 58.5	19.6	208 20.6	29.4	243 27.3	25.7
18	329 48.8	106 39.2	S15 20.0	9 59.2	S17 19.0	223 23.2	N22 29.4	258 30.0	N20 25.7
19	344 51.3	121 38.6	21.0	24 59.9	18.4	238 25.8	29.4	273 32.7	25.7
20	359 53.7	136 37.9	22.0	40 00.6	17.8	253 28.5	29.4	288 35.3	25.6
21	14 56.2	151 37.3 . .	22.9	55 01.3 . .	17.2	268 31.1 . .	29.4	303 38.0 . .	25.6
22	29 58.7	166 36.7	23.9	70 02.0	16.6	283 33.7	29.5	318 40.7	25.6
23	45 01.1	181 36.0	24.9	85 02.7	16.0	298 36.3	29.5	333 43.4	25.6
	h m								
Pas. Mer.	20 04.3	v −0.6	d 1.0	v 0.7	d 0.6	v 2.6	d 0.0	v 2.7	d 0.0

ESTRELLAS

Nombre	A.H.S.	Dec.
	° ′	° ′
Acamar	315 24.8	S40 17.9
Achernar	335 32.9	S57 13.9
Acrux	173 20.1	S63 06.2
Adhara	255 19.4	S28 58.3
Aldebaran	290 59.5	N16 30.8
Alioth	166 29.0	N55 56.9
Alkaid	153 06.4	N49 18.3
Al Na'ir	27 55.1	S46 57.4
Alnilam	275 55.3	S 1 12.0
Alphard	218 05.0	S 8 39.8
Alphecca	126 19.1	N26 42.6
Alpheratz	357 52.8	N29 06.1
Altair	62 17.3	N 8 52.5
Ankaa	353 24.3	S42 18.0
Antares	112 37.9	S26 26.1
Arcturus	146 04.4	N19 10.5
Atria	107 48.5	S69 01.9
Avior	234 21.6	S59 30.6
Bellatrix	278 41.5	N 6 21.1
Betelgeuse	271 10.9	N 7 24.5
Canopus	263 59.8	S52 41.6
Capella	280 47.5	N45 59.9
Deneb	49 37.9	N45 17.4
Denebola	182 43.1	N14 33.8
Diphda	349 04.8	S17 58.7
Dubhe	194 02.9	N61 44.3
Elnath	278 23.8	N28 36.5
Eltanin	90 50.9	N51 29.5
Enif	33 56.1	N 9 53.0
Fomalhaut	15 33.9	S29 37.0
Gacrux	172 11.6	S57 07.0
Gienah	176 01.9	S17 32.9
Hadar	149 01.6	S60 22.6
Hamal	328 10.8	N23 28.3
Kaus Aust.	83 56.2	S34 23.1
Kochab	137 20.6	N74 08.9
Markab	13 47.4	N15 13.0
Menkar	314 24.3	N 4 05.8
Menkent	148 18.8	S36 22.5
Miaplacidus	221 41.6	S69 43.1
Mirfak	308 53.0	N49 52.1
Nunki	76 09.9	S26 17.7
Peacock	53 33.7	S56 44.0
Pollux	243 38.7	N28 01.3
Procyon	245 09.1	N 5 13.3
Rasalhague	96 15.2	N12 33.6
Regulus	207 53.2	N11 57.6
Rigel	281 20.5	S 8 11.9
Rigil Kent.	140 05.1	S60 50.3
Sabik	102 23.4	S15 43.6
Schedar	349 50.7	N56 33.0
Shaula	96 34.7	S37 06.3
Sirius	258 41.5	S16 43.0
Spica	158 41.2	S11 10.0
Suhail	222 59.1	S43 26.0
Vega	80 45.5	N38 47.3
Zuben'ubi	137 15.9	S16 02.8

	A.H.S.	Pas. Mer.
	° ′	h m
Venus	138 59.8	10 52
Marte	41 24.7	17 21
Júpiter	253 28.0	3 13
Saturno	288 32.6	0 53

T.U.	SOL				LUNA					
	A.H.G.		Dec.		A.H.G.	v	Dec.	d	P.H.	
d h	°	′	°	′	°	′	°	′	′	′
18 00	183	43.4	S19	11.2	147	29.5	8.1	S23	38.6	3.0	56.7
01	198	43.3		11.7	161	56.6	8.0	23	41.6	2.8	56.7
02	213	43.2		12.3	176	23.6	8.1	23	44.4	2.7	56.7
03	228	43.0	. .	12.9	190	50.7	8.1	23	47.1	2.6	56.6
04	243	42.9		13.5	205	17.8	8.2	23	49.7	2.4	56.6
05	258	42.8		14.1	219	45.0	8.1	23	52.1	2.3	56.6
06	273	42.6	S19	14.7	234	12.1	8.2	S23	54.4	2.2	56.5
07	288	42.5		15.3	248	39.3	8.2	23	56.6	2.0	56.5
D 08	303	42.4		15.9	263	06.5	8.2	23	58.6	1.9	56.5
O 09	318	42.2	. .	16.5	277	33.7	8.2	24	00.5	1.7	56.5
M 10	333	42.1		17.1	292	00.9	8.3	24	02.2	1.6	56.4
I 11	348	42.0		17.7	306	28.2	8.2	24	03.8	1.5	56.4
N 12	3	41.8	S19	18.3	320	55.4	8.4	S24	05.3	1.4	56.4
G 13	18	41.7		18.9	335	22.8	8.3	24	06.7	1.2	56.3
O 14	33	41.6		19.5	349	50.1	8.4	24	07.9	1.0	56.3
15	48	41.4	. .	20.1	4	17.5	8.4	24	08.9	1.0	56.3
16	63	41.3		20.7	18	44.9	8.4	24	09.9	0.8	56.2
17	78	41.2		21.2	33	12.3	8.5	24	10.7	0.6	56.2
18	93	41.0	S19	21.8	47	39.8	8.5	S24	11.3	0.6	56.2
19	108	40.9		22.4	62	07.3	8.5	24	11.9	0.4	56.2
20	123	40.7		23.0	76	34.8	8.6	24	12.3	0.2	56.1
21	138	40.6	. .	23.6	91	02.4	8.6	24	12.5	0.2	56.1
22	153	40.5		24.2	105	30.0	8.7	24	12.7	0.0	56.1
23	168	40.3		24.8	119	57.7	8.7	24	12.7	0.2	56.0
19 00	183	40.2	S19	25.3	134	25.4	8.7	S24	12.5	0.2	56.0
01	198	40.1		25.9	148	53.1	8.8	24	12.3	0.4	56.0
02	213	39.9		26.5	163	20.9	8.8	24	11.9	0.5	55.9
03	228	39.8	. .	27.1	177	48.7	8.8	24	11.4	0.7	55.9
04	243	39.6		27.7	192	16.5	8.9	24	10.7	0.8	55.9
05	258	39.5		28.3	206	44.4	9.0	24	09.9	0.9	55.9
06	273	39.4	S19	28.8	221	12.4	9.0	S24	09.0	1.0	55.8
07	288	39.2		29.4	235	40.4	9.0	24	08.0	1.2	55.8
L 08	303	39.1		30.0	250	08.4	9.1	24	06.8	1.3	55.8
U 09	318	38.9	. .	30.6	264	36.5	9.1	24	05.5	1.4	55.8
N 10	333	38.8		31.2	279	04.6	9.2	24	04.1	1.5	55.7
E 11	348	38.6		31.7	293	32.8	9.3	24	02.6	1.7	55.7
S 12	3	38.5	S19	32.3	308	01.1	9.3	S24	00.9	1.8	55.7
13	18	38.4		32.9	322	29.4	9.3	23	59.1	1.9	55.6
14	33	38.2		33.5	336	57.7	9.4	23	57.2	2.0	55.6
15	48	38.1	. .	34.0	351	26.1	9.4	23	55.2	2.2	55.6
16	63	37.9		34.6	5	54.5	9.5	23	53.0	2.3	55.6
17	78	37.8		35.2	20	23.0	9.6	23	50.7	2.4	55.5
18	93	37.6	S19	35.8	34	51.6	9.6	S23	48.3	2.5	55.5
19	108	37.5		36.3	49	20.2	9.7	23	45.8	2.7	55.5
20	123	37.4		36.9	63	48.9	9.7	23	43.1	2.7	55.5
21	138	37.2	. .	37.5	78	17.6	9.8	23	40.4	2.9	55.4
22	153	37.1		38.0	92	46.4	9.8	23	37.5	3.0	55.4
23	168	36.9		38.6	107	15.2	9.9	23	34.5	3.1	55.4
20 00	183	36.8	S19	39.2	121	44.1	10.0	S23	31.4	3.3	55.4
01	198	36.6		39.8	136	13.1	10.0	23	28.1	3.3	55.3
02	213	36.5		40.3	150	42.1	10.1	23	24.8	3.5	55.3
03	228	36.3	. .	40.9	165	11.2	10.1	23	21.3	3.6	55.3
04	243	36.2		41.5	179	40.3	10.2	23	17.7	3.7	55.3
05	258	36.0		42.0	194	09.5	10.3	23	14.0	3.8	55.2
06	273	35.9	S19	42.6	208	38.8	10.3	S23	10.2	3.9	55.2
07	288	35.7		43.2	223	08.1	10.4	23	06.3	4.0	55.2
M 08	303	35.6		43.7	237	37.5	10.5	23	02.3	4.2	55.2
A 09	318	35.4	. .	44.3	252	07.0	10.5	22	58.1	4.2	55.2
R 10	333	35.3		44.8	266	36.5	10.6	22	53.9	4.4	55.1
T 11	348	35.1		45.4	281	06.1	10.6	22	49.5	4.4	55.1
E 12	3	35.0	S19	46.0	295	35.7	10.7	S22	45.1	4.6	55.1
S 13	18	34.8		46.5	310	05.4	10.8	22	40.5	4.7	55.1
14	33	34.7		47.1	324	35.2	10.8	22	35.8	4.8	55.0
15	48	34.5	. .	47.7	339	05.0	10.9	22	31.0	4.9	55.0
16	63	34.4		48.2	353	34.9	11.0	22	26.1	5.0	55.0
17	78	34.2		48.8	8	04.9	11.1	22	21.1	5.1	55.0
18	93	34.1	S19	49.3	22	35.0	11.1	S22	16.0	5.2	55.0
19	108	33.9		49.9	37	05.1	11.1	22	10.8	5.3	54.9
20	123	33.8		50.4	51	35.2	11.3	22	05.5	5.4	54.9
21	138	33.6	. .	51.0	66	05.5	11.3	22	00.1	5.5	54.9
22	153	33.4		51.6	80	35.8	11.3	21	54.6	5.6	54.9
23	168	33.3		52.1	95	06.1	11.5	S21	49.0	5.7	54.9
	SD	16.2	d	0.6	SD		15.4		15.2		15.0

Lat.	Crepúsculo Náutico	Crepúsculo Civil	Orto Sol	Orto Luna 18	Orto Luna 19	Orto Luna 20	Orto Luna 21
°	h m	h m	h m	h m	h m	h m	h m
N 72	07 14	08 53	▬	▬	▬	▬	▬
N 70	07 02	08 27	10 19	▬	▬	▬	17 00
68	06 52	08 07	09 32	▬	▬	▬	15 32
66	06 44	07 51	09 03	▬	▬	15 01	14 54
64	06 37	07 38	08 40	13 08	13 57	14 18	14 26
62	06 31	07 27	08 23	12 28	13 20	13 49	14 05
60	06 25	07 18	08 08	12 01	12 53	13 27	13 48
N 58	06 20	07 09	07 55	11 40	12 32	13 09	13 34
56	06 15	07 02	07 45	11 22	12 15	12 54	13 21
54	06 11	06 55	07 35	11 07	12 00	12 41	13 11
52	06 07	06 49	07 27	10 54	11 48	12 29	13 01
50	06 03	06 43	07 19	10 43	11 36	12 19	12 52
45	05 55	06 31	07 03	10 19	11 13	11 57	12 34
N 40	05 47	06 20	06 50	10 01	10 54	11 40	12 19
35	05 40	06 11	06 38	09 45	10 39	11 25	12 06
30	05 34	06 03	06 28	09 31	10 25	11 13	11 55
20	05 21	05 48	06 11	09 08	10 02	10 51	11 36
N 10	05 08	05 34	05 56	08 48	09 42	10 32	11 19
0	04 54	05 20	05 42	08 29	09 23	10 15	11 03
S 10	04 39	05 05	05 27	08 10	09 04	09 57	10 48
20	04 20	04 48	05 12	07 51	08 44	09 38	10 31
30	03 56	04 28	04 54	07 28	08 21	09 16	10 12
35	03 41	04 15	04 44	07 14	08 07	09 03	10 00
40	03 22	04 01	04 31	06 59	07 52	08 48	09 47
45	02 59	03 43	04 17	06 40	07 33	08 31	09 32
S 50	02 26	03 20	04 00	06 17	07 09	08 09	09 13
52	02 09	03 09	03 51	06 06	06 58	07 58	09 04
54	01 48	02 56	03 42	05 54	06 46	07 47	08 54
56	01 19	02 41	03 32	05 39	06 31	07 33	08 42
58	00 31	02 22	03 19	05 23	06 14	07 17	08 29
S 60	////	02 00	03 05	05 03	05 53	06 58	08 13

Lat.	Ocaso Sol	Crepúsculo Civil	Crepúsculo Náutico	Ocaso Luna 18	Ocaso Luna 19	Ocaso Luna 20	Ocaso Luna 21
°	h m	h m	h m	h m	h m	h m	h m
N 72	▬	14 36	16 16	▬	▬	▬	▬
N 70	13 11	15 03	16 28	▬	▬	▬	17 42
68	13 58	15 23	16 38	▬	▬	▬	19 09
66	14 28	15 39	16 46	▬	▬	17 59	19 47
64	14 50	15 52	16 53	16 15	17 17	18 42	20 13
62	15 08	16 03	17 00	16 55	17 54	19 11	20 34
60	15 22	16 13	17 05	17 22	18 21	19 32	20 50
N 58	15 35	16 21	17 10	17 44	18 41	19 50	21 04
56	15 46	16 29	17 15	18 01	18 58	20 05	21 16
54	15 55	16 35	17 19	18 16	19 13	20 18	21 27
52	16 04	16 42	17 23	18 29	19 26	20 29	21 36
50	16 11	16 47	17 27	18 40	19 37	20 39	21 44
45	16 27	17 00	17 35	19 04	20 00	21 00	22 02
N 40	16 41	17 10	17 43	19 23	20 18	21 16	22 16
35	16 52	17 19	17 50	19 39	20 34	21 31	22 28
30	17 02	17 28	17 57	19 53	20 47	21 43	22 38
20	17 20	17 43	18 10	20 16	21 10	22 04	22 56
N 10	17 35	17 57	18 23	20 36	21 30	22 22	23 12
0	17 49	18 11	18 36	20 55	21 48	22 38	23 26
S 10	18 03	18 26	18 52	21 14	22 06	22 55	23 40
20	18 19	18 43	19 11	21 34	22 26	23 13	23 56
30	18 37	19 03	19 35	21 57	22 48	23 33	24 13
35	18 48	19 16	19 51	22 11	23 02	23 45	24 23
40	19 00	19 31	20 09	22 27	23 17	23 59	24 35
45	19 14	19 49	20 33	22 46	23 35	24 15	00 15
S 50	19 32	20 12	21 06	23 09	23 57	24 35	00 35
52	19 41	20 24	21 24	23 20	24 08	00 08	00 44
54	19 50	20 37	21 46	23 33	24 20	00 20	00 55
56	20 01	20 52	22 15	23 48	24 34	00 34	01 07
58	20 13	21 11	23 10	24 05	00 05	00 50	01 20
S 60	20 27	21 34	////	24 26	00 26	01 09	01 36

Día	SOL E.T. (+) 00h	SOL E.T. (+) 12h	SOL Pas. Mer.	LUNA Pas. Sup.	LUNA Mer. Inf.	LUNA Edad	LUNA Fase
d	m s	m s	h m	h m	h m	d	%
18	14 54	14 48	11 45	14 42	02 15	03	12
19	14 41	14 34	11 45	15 36	03 09	04	19
20	14 27	14 20	11 46	16 27	04 01	05	27

T.U.	ARIES	VENUS −3.9		MARTE +0.3		JUPITER −2.6		SATURNO −0.4	
	A.H.G.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
21 00	60 03.6	196 35.4	S15 25.9	100 03.4	S17 15.4	313 39.0	N22 29.5	348 46.0	N20 25.5
01	75 06.1	211 34.8	26.8	115 04.1	14.8	328 41.6	29.5	3 48.7	25.5
02	90 08.5	226 34.2	27.8	130 04.8	14.2	343 44.2	29.6	18 51.4	25.5
03	105 11.0	241 33.5 . .	28.8	145 05.5 . .	13.6	358 46.8 . .	29.6	33 54.0 . .	25.5
04	120 13.4	256 32.9	29.8	160 06.2	13.0	13 49.5	29.6	48 56.7	25.4
05	135 15.9	271 32.3	30.7	175 06.8	12.4	28 52.1	29.6	63 59.4	25.4
06	150 18.4	286 31.6	S15 31.7	190 07.5	S17 11.8	43 54.7	N22 29.6	79 02.1	N20 25.4
M 07	165 20.8	301 31.0	32.7	205 08.2	11.2	58 57.4	29.7	94 04.7	25.4
I 08	180 23.3	316 30.4	33.6	220 08.9	10.6	74 00.0	29.7	109 07.4	25.3
09	195 25.8	331 29.7 . .	34.6	235 09.6 . .	10.0	89 02.6 . .	29.7	124 10.1 . .	25.3
E 10	210 28.2	346 29.1	35.6	250 10.3	09.4	104 05.2	29.7	139 12.7	25.3
R 11	225 30.7	1 28.4	36.6	265 11.0	08.8	119 07.9	29.8	154 15.4	25.3
C 12	240 33.2	16 27.8	S15 37.5	280 11.7	S17 08.2	134 10.5	N22 29.8	169 18.1	N20 25.2
O 13	255 35.6	31 27.2	38.5	295 12.4	07.6	149 13.1	29.8	184 20.8	25.2
L 14	270 38.1	46 26.5	39.4	310 13.1	06.9	164 15.8	29.8	199 23.4	25.2
E 15	285 40.6	61 25.9 . .	40.4	325 13.8 . .	06.3	179 18.4 . .	29.8	214 26.1 . .	25.2
S 16	300 43.0	76 25.3	41.4	340 14.5	05.7	194 21.0	29.9	229 28.8	25.2
17	315 45.5	91 24.6	42.3	355 15.2	05.1	209 23.7	29.9	244 31.5	25.1
18	330 47.9	106 24.0	S15 43.3	10 15.9	S17 04.5	224 26.3	N22 29.9	259 34.1	N20 25.1
19	345 50.4	121 23.3	44.3	25 16.6	03.9	239 28.9	29.9	274 36.8	25.1
20	0 52.9	136 22.7	45.2	40 17.3	03.3	254 31.6	30.0	289 39.5	25.1
21	15 55.3	151 22.1 . .	46.2	55 18.0 . .	02.7	269 34.2 . .	30.0	304 42.1 . .	25.0
22	30 57.8	166 21.4	47.1	70 18.7	02.1	284 36.8	30.0	319 44.8	25.0
23	46 00.3	181 20.8	48.1	85 19.4	01.5	299 39.5	30.0	334 47.5	25.0
22 00	61 02.7	196 20.1	S15 49.1	100 20.1	S17 00.9	314 42.1	N22 30.0	349 50.2	N20 25.0
01	76 05.2	211 19.5	50.0	115 20.8	17 00.3	329 44.7	30.1	4 52.8	24.9
02	91 07.7	226 18.8	51.0	130 21.5	16 59.6	344 47.4	30.1	19 55.5	24.9
03	106 10.1	241 18.2 . .	51.9	145 22.2 . .	59.0	359 50.0 . .	30.1	34 58.2 . .	24.9
04	121 12.6	256 17.6	52 9	160 22.9	58.4	14 52.6	30.1	50 00.9	24.9
05	136 15.1	271 16.9	53.8	175 23.6	57.8	29 55.3	30.2	65 03.5	24.8
06	151 17.5	286 16.3	S15 54.8	190 24.3	S16 57.2	44 57.9	N22 30.2	80 06.2	N20 24.8
07	166 20.0	301 15.6	55.7	205 25.0	56.6	60 00.5	30.2	95 08.9	24.8
J 08	181 22.4	316 15.0	56.7	220 25.7	56.0	75 03.2	30.2	110 11.6	24.8
U 09	196 24.9	331 14.3 . .	57.7	235 26.4 . .	55.4	90 05.8 . .	30.3	125 14.2 . .	24.7
E 10	211 27.4	346 13.7	58.6	250 27.1	54.8	105 08.5	30.3	140 16.9	24.7
V 11	226 29.8	1 13.0	15 59.6	265 27.8	54.1	120 11.1	30.3	155 19.6	24.7
E 12	241 32.3	16 12.4	S16 00.5	280 28.5	S16 53.5	135 13.7	N22 30.3	170 22.3	N20 24.7
S 13	256 34.8	31 11.7	01.5	295 29.2	52.9	150 16.4	30.3	185 24.9	24.6
14	271 37.2	46 11.1	02.4	310 29.9	52.3	165 19.0	30.4	200 27.6	24.6
15	286 39.7	61 10.4 . .	03.3	325 30.6 . .	51.7	180 21.6 . .	30.4	215 30.3 . .	24.6
16	301 42.2	76 09.8	04.3	340 31.3	51.1	195 24.3	30.4	230 32.9	24.6
17	316 44.6	91 09.1	05.2	355 32.0	50.5	210 26.9	30.4	245 35.6	24.6
18	331 47.1	106 08.5	S16 06.2	10 32.7	S16 49.9	225 29.6	N22 30.5	260 38.3	N20 24.5
19	346 49.5	121 07.8	07.1	25 33.4	49.2	240 32.2	30.5	275 41.0	24.5
20	1 52.0	136 07.2	08.1	40 34.1	48.6	255 34.8	30.5	290 43.6	24.5
21	16 54.5	151 06.5 . .	09.0	55 34.8 . .	48.0	270 37.5 . .	30.5	305 46.3 . .	24.5
22	31 56.9	166 05.9	10.0	70 35.5	47.4	285 40.1	30.6	320 49.0	24.4
23	46 59.4	181 05.2	10.9	85 36.2	46.8	300 42.8	30.6	335 51.7	24.4
23 00	62 01.9	196 04.6	S16 11.8	100 36.9	S16 46.2	315 45.4	N22 30.6	350 54.3	N20 24.4
01	77 04.3	211 03.9	12.8	115 37.6	45.5	330 48.1	30.6	5 57.0	24.4
02	92 06.8	226 03.2	13.7	130 38.3	44.9	345 50.7	30.7	20 59.7	24.3
03	107 09.3	241 02.6 . .	14.7	145 39.0 . .	44.3	0 53.3 . .	30.7	36 02.4 . .	24.3
04	122 11.7	256 01.9	15.6	160 39.7	43.7	15 56.0	30.7	51 05.0	24.3
05	137 14.2	271 01.3	16.5	175 40.4	43.1	30 58.6	30.7	66 07.7	24.3
06	152 16.7	286 00.6	S16 17.5	190 41.1	S16 42.5	46 01.3	N22 30.7	81 10.4	N20 24.2
07	167 19.1	301 00.0	18.4	205 41.8	41.9	61 03.9	30.8	96 13.1	24.2
V 08	182 21.6	315 59.3	19.3	220 42.5	41.2	76 06.6	30.8	111 15.7	24.2
I 09	197 24.0	330 58.6 . .	20.3	235 43.2 . .	40.6	91 09.2 . .	30.8	126 18.4 . .	24.2
E 10	212 26.5	345 58.0	21.2	250 43.9	40.0	106 11.9	30.8	141 21.1	24.1
R 11	227 29.0	0 57.3	22.1	265 44.6	39.4	121 14.5	30.9	156 23.8	24.1
N 12	242 31.4	15 56.7	S16 23.1	280 45.3	S16 38.8	136 17.2	N22 30.9	171 26.4	N20 24.1
E 13	257 33.9	30 56.0	24.0	295 46.0	38.1	151 19.8	30.9	186 29.1	24.1
S 14	272 36.4	45 55.3	24.9	310 46.7	37.5	166 22.5	30.9	201 31.8	24.0
15	287 38.8	60 54.7 . .	25.9	325 47.4 . .	36.9	181 25.1 . .	31.0	216 34.5 . .	24.0
16	302 41.3	75 54.0	26.8	340 48.1	36.3	196 27.7	31.0	231 37.1	24.0
17	317 43.8	90 53.4	27.7	355 48.8	35.7	211 30.4	31.0	246 39.8	24.0
18	332 46.2	105 52.7	S16 28.6	10 49.5	S16 35.0	226 33.0	N22 31.0	261 42.5	N20 23.9
19	347 48.7	120 52.0	29.6	25 50.2	34.4	241 35.7	31.1	276 45.2	23.9
20	2 51.2	135 51.4	30.5	40 50.9	33.8	256 38.3	31.1	291 47.8	23.9
21	17 53.6	150 50.7 . .	31.4	55 51.6 . .	33.2	271 41.0 . .	31.1	306 50.5 . .	23.9
22	32 56.1	165 50.0	32.3	70 52.3	32.6	286 43.6	31.1	321 53.2	23.9
23	47 58.5	180 49.4	33.3	85 53.0	31.9	301 46.3	31.2	336 55.9	23.8
	h m								
Pas. Mer.	19 52.6	*v* −0.6	*d* 0.9	*v* 0.7	*d* 0.6	*v* 2.6	*d* 0.0	*v* 2.7	*d* 0.0

ESTRELLAS		
Nombre	A.H.S.	Dec.
	° ′	° ′
Acamar	315 24.8	S40 17.9
Achernar	335 32.9	S57 13.9
Acrux	173 20.1	S63 06.2
Adhara	255 19.4	S28 58.3
Aldebaran	290 59.5	N16 30.8
Alioth	166 28.9	N55 56.9
Alkaid	153 06.4	N49 18.2
Al Na'ir	27 55.1	S46 57.4
Alnilam	275 55.3	S 1 12.0
Alphard	218 05.0	S 8 39.8
Alphecca	126 19.1	N26 42.6
Alpheratz	357 52.8	N29 06.1
Altair	62 17.3	N 8 52.5
Ankaa	353 24.4	S42 18.0
Antares	112 37.9	S26 26.1
Arcturus	146 04.4	N19 10.5
Atria	107 48.5	S69 01.8
Avior	234 21.5	S59 30.6
Bellatrix	278 41.5	N 6 21.1
Betelgeuse	271 10.9	N 7 24.5
Canopus	263 59.7	S52 41.6
Capella	280 47.5	N45 59.9
Deneb	49 37.9	N45 17.4
Denebola	182 43.1	N14 33.8
Diphda	349 04.8	S17 58.7
Dubhe	194 02.8	N61 44.3
Elnath	278 23.8	N28 36.5
Eltanin	90 50.9	N51 29.5
Enif	33 56.1	N 9 53.0
Fomalhaut	15 33.9	S29 37.0
Gacrux	172 11.6	S57 07.0
Gienah	176 01.9	S17 32.9
Hadar	149 01.6	S60 22.6
Hamal	328 10.8	N23 28.3
Kaus Aust.	83 56.2	S34 23.1
Kochab	137 20.6	N74 08.9
Markab	13 47.4	N15 13.0
Menkar	314 24.3	N 4 05.8
Menkent	148 18.8	S36 22.5
Miaplacidus	221 41.5	S69 43.1
Mirfak	308 53.0	N49 52.1
Nunki	76 09.9	S26 17.7
Peacock	53 33.8	S56 44.0
Pollux	243 38.6	N28 01.3
Procyon	245 09.1	N 5 13.3
Rasalhague	96 15.2	N12 33.6
Regulus	207 53.2	N11 57.6
Rigel	281 20.5	S 8 11.9
Rigil Kent.	140 05.1	S60 50.3
Sabik	102 23.4	S15 43.6
Schedar	349 50.7	N56 33.0
Shaula	96 34.7	S37 06.3
Sirius	258 41.5	S16 43.0
Spica	158 41.2	S11 10.0
Suhail	222 59.1	S43 26.1
Vega	80 45.5	N38 47.3
Zuben'ubi	137 15.9	S16 02.8

	A.H.S.	Pas. Mer.
	° ′	h m
Venus	135 17.4	10 55
Marte	39 17.4	17 18
Júpiter	253 39.4	3 01
Saturno	288 47.4	0 41

T.U.	SOL				LUNA						
	A.H.G.		Dec.		A.H.G.	v		Dec.	d	P.H.	
d h	°	′	°	′	°	′	′	°	′	′	′
21 00	183	33.1	S19	52.7	109	36.6	11.5	S21	43.3	5.8	54.8
01	198	33.0		53.2	124	07.1	11.5	21	37.5	5.9	54.8
02	213	32.8		53.8	138	37.6	11.7	21	31.6	6.0	54.8
03	228	32.7	. .	54.3	153	08.3	11.7	21	25.6	6.1	54.8
04	243	32.5		54.9	167	39.0	11.7	21	19.5	6.2	54.8
05	258	32.4		55.4	182	09.7	11.9	21	13.3	6.3	54.7
06	273	32.2	S19	56.0	196	40.6	11.9	S21	07.0	6.4	54.7
M 07	288	32.0		56.5	211	11.5	11.9	21	00.6	6.4	54.7
I 08	303	31.9		57.1	225	42.4	12.1	20	54.2	6.6	54.7
E 09	318	31.7	. .	57.6	240	13.5	12.1	20	47.6	6.6	54.7
R 10	333	31.6		58.2	254	44.6	12.2	20	41.0	6.8	54.7
C 11	348	31.4		58.7	269	15.8	12.2	20	34.2	6.8	54.6
O 12	3	31.2	S19	59.3	283	47.0	12.3	S20	27.4	6.9	54.6
L 13	18	31.1	19	59.8	298	18.3	12.3	20	20.5	7.0	54.6
E 14	33	30.9	20	00.4	312	49.6	12.5	20	13.5	7.1	54.6
S 15	48	30.8	. .	00.9	327	21.1	12.5	20	06.4	7.2	54.6
16	63	30.6		01.5	341	52.6	12.5	19	59.2	7.3	54.6
17	78	30.4		02.0	356	24.1	12.7	19	51.9	7.3	54.6
18	93	30.3	S20	02.5	10	55.8	12.6	S19	44.6	7.4	54.5
19	108	30.1		03.1	25	27.4	12.8	19	37.2	7.5	54.5
20	123	30.0		03.6	39	59.2	12.8	19	29.7	7.6	54.5
21	138	29.8	. .	04.2	54	31.0	12.9	19	22.1	7.7	54.5
22	153	29.6		04.7	69	02.9	12.9	19	14.4	7.8	54.5
23	168	29.5		05.3	83	34.8	13.0	19	06.6	7.8	54.5
22 00	183	29.3	S20	05.8	98	06.8	13.1	S18	58.8	7.9	54.5
01	198	29.1		06.3	112	38.9	13.2	18	50.9	8.0	54.5
02	213	29.0		06.9	127	11.1	13.1	18	42.9	8.1	54.4
03	228	28.8	. .	07.4	141	43.2	13.3	18	34.8	8.1	54.4
04	243	28.7		07.9	156	15.5	13.3	18	26.7	8.3	54.4
05	258	28.5		08.5	170	47.8	13.4	18	18.4	8.3	54.4
06	273	28.3	S20	09.0	185	20.2	13.4	S18	10.1	8.3	54.4
J 07	288	28.2		09.5	199	52.6	13.5	18	01.8	8.5	54.4
U 08	303	28.0		10.1	214	25.1	13.6	17	53.3	8.5	54.4
E 09	318	27.8	. .	10.6	228	57.7	13.6	17	44.8	8.6	54.4
V 10	333	27.7		11.1	243	30.3	13.7	17	36.2	8.7	54.4
E 11	348	27.5		11.7	258	03.0	13.7	17	27.5	8.7	54.3
S 12	3	27.3	S20	12.2	272	35.7	13.8	S17	18.8	8.8	54.3
13	18	27.2		12.7	287	08.5	13.8	17	10.0	8.9	54.3
14	33	27.0		13.3	301	41.3	13.9	17	01.1	8.9	54.3
15	48	26.8	. .	13.8	316	14.2	14.0	16	52.2	9.0	54.3
16	63	26.7		14.3	330	47.2	14.0	16	43.2	9.1	54.3
17	78	26.5		14.9	345	20.2	14.0	16	34.1	9.2	54.3
18	93	26.3	S20	15.4	359	53.2	14.2	S16	24.9	9.2	54.3
19	108	26.1		15.9	14	26.4	14.1	16	15.7	9.3	54.3
20	123	26.0		16.4	28	59.5	14.2	16	06.4	9.3	54.3
21	138	25.8	. .	17.0	43	32.7	14.3	15	57.1	9.4	54.3
22	153	25.6		17.5	58	06.0	14.3	15	47.7	9.5	54.3
23	168	25.5		18.0	72	39.3	14.4	15	38.2	9.5	54.3
23 00	183	25.3	S20	18.5	87	12.7	14.4	S15	28.7	9.6	54.3
01	198	25.1		19.1	101	46.1	14.5	15	19.1	9.6	54.3
02	213	24.9		19.6	116	19.6	14.5	15	09.5	9.8	54.3
03	228	24.8	. .	20.1	130	53.1	14.6	14	59.7	9.7	54.2
04	243	24.6		20.6	145	26.7	14.6	14	50.0	9.8	54.2
05	258	24.4		21.2	160	00.3	14.7	14	40.2	9.9	54.2
06	273	24.3	S20	21.7	174	34.0	14.7	S14	30.3	10.0	54.2
07	288	24.1		22.2	189	07.7	14.8	14	20.3	10.0	54.2
V 08	303	23.9		22.7	203	41.5	14.8	14	10.3	10.0	54.2
I 09	318	23.7	. .	23.2	218	15.3	14.8	14	00.3	10.2	54.2
E 10	333	23.6		23.7	232	49.1	14.9	13	50.1	10.1	54.2
R 11	348	23.4		24.3	247	23.0	14.9	13	40.0	10.2	54.2
N 12	3	23.2	S20	24.8	261	56.9	15.0	S13	29.8	10.3	54.2
E 13	18	23.0		25.3	276	30.9	15.0	13	19.5	10.3	54.2
S 14	33	22.9		25.8	291	04.9	15.1	13	09.2	10.4	54.2
15	48	22.7	. .	26.3	305	39.0	15.1	12	58.8	10.5	54.2
16	63	22.5		26.8	320	13.1	15.1	12	48.3	10.4	54.2
17	78	22.3		27.3	334	47.2	15.2	12	37.9	10.6	54.2
18	93	22.2	S20	27.9	349	21.4	15.2	S12	27.3	10.6	54.2
19	108	22.0		28.4	3	55.6	15.2	12	16.7	10.6	54.2
20	123	21.8		28.9	18	29.8	15.3	12	06.1	10.7	54.2
21	138	21.6	. .	29.4	33	04.1	15.3	11	55.4	10.7	54.2
22	153	21.4		29.9	47	38.4	15.3	11	44.7	10.8	54.2
23	168	21.3		30.4	62	12.7	15.4	S11	33.9	10.8	54.2
	SD	16.2	d	0.5	SD		14.9		14.8		14.8

Lat.	Crepúsculo Náutico	Crepúsculo Civil	Orto Sol	Orto Luna 21	Orto Luna 22	Orto Luna 23	Orto Luna 24
°	h m	h m	h m	h m	h m	h m	h m
N 72	07 24	09 08	▬	▬	16 29	15 39	15 10
N 70	07 11	08 39	10 45	17 00	15 42	15 16	14 58
68	07 00	08 17	09 47	15 32	15 11	14 58	14 47
66	06 51	08 00	09 14	14 54	14 48	14 43	14 39
64	06 43	07 46	08 50	14 26	14 30	14 31	14 31
62	06 37	07 34	08 31	14 05	14 15	14 21	14 25
60	06 31	07 24	08 15	13 48	14 02	14 12	14 20
N 58	06 25	07 15	08 02	13 34	13 51	14 04	14 15
56	06 20	07 07	07 51	13 21	13 42	13 57	14 10
54	06 16	07 00	07 41	13 11	13 33	13 51	14 06
52	06 11	06 53	07 32	13 01	13 26	13 46	14 03
50	06 07	06 47	07 24	12 52	13 19	13 41	14 00
45	05 58	06 35	07 07	12 34	13 04	13 30	13 53
N 40	05 50	06 24	06 53	12 19	12 52	13 21	13 47
35	05 43	06 14	06 41	12 06	12 41	13 13	13 42
30	05 36	06 05	06 31	11 55	12 32	13 06	13 37
20	05 23	05 50	06 13	11 36	12 17	12 54	13 29
N 10	05 09	05 35	05 57	11 19	12 03	12 43	13 22
0	04 55	05 21	05 43	11 03	11 50	12 34	13 16
S 10	04 39	05 05	05 28	10 48	11 37	12 24	13 09
20	04 19	04 48	05 12	10 31	11 23	12 13	13 02
30	03 55	04 27	04 53	10 12	11 07	12 01	12 54
35	03 39	04 14	04 42	10 00	10 57	11 54	12 50
40	03 20	03 58	04 30	09 47	10 47	11 46	12 44
45	02 55	03 40	04 15	09 32	10 34	11 36	12 38
S 50	02 21	03 16	03 56	09 13	10 19	11 25	12 31
52	02 02	03 04	03 48	09 04	10 11	11 19	12 27
54	01 39	02 50	03 38	08 54	10 03	11 14	12 24
56	01 07	02 34	03 27	08 42	09 54	11 07	12 19
58	////	02 15	03 14	08 29	09 44	11 00	12 15
S 60	////	01 50	02 59	08 13	09 32	10 51	12 10

Lat.	Ocaso Sol	Crepúsculo Civil	Crepúsculo Náutico	Ocaso Luna 21	Ocaso Luna 22	Ocaso Luna 23	Ocaso Luna 24
°	h m	h m	h m	h m	h m	h m	h m
N 72	▬	14 24	16 07	▬	19 49	22 09	24 06
N 70	12 46	14 53	16 21	17 42	20 35	22 31	24 16
68	13 44	15 14	16 31	19 09	21 05	22 47	24 25
66	14 18	15 32	16 40	19 47	21 26	23 01	24 32
64	14 42	15 46	16 48	20 13	21 44	23 12	24 38
62	15 01	15 58	16 55	20 34	21 58	23 21	24 43
60	15 17	16 08	17 01	20 50	22 10	23 29	24 47
N 58	15 30	16 17	17 07	21 04	22 20	23 36	24 51
56	15 41	16 25	17 12	21 16	22 29	23 42	24 54
54	15 51	16 32	17 16	21 27	22 37	23 47	24 57
52	16 00	16 39	17 20	21 36	22 44	23 52	25 00
50	16 08	16 44	17 24	21 44	22 50	23 57	25 03
45	16 25	16 57	17 33	22 02	23 04	24 06	00 06
N 40	16 39	17 08	17 42	22 16	23 15	24 14	00 14
35	16 51	17 18	17 49	22 28	23 25	24 21	00 21
30	17 01	17 27	17 56	22 38	23 33	24 27	00 27
20	17 19	17 43	18 10	22 56	23 47	24 37	00 37
N 10	17 35	17 57	18 23	23 12	24 00	00 00	00 46
0	17 50	18 12	18 37	23 26	24 11	00 11	00 54
S 10	18 05	18 27	18 54	23 40	24 23	00 23	01 02
20	18 21	18 45	19 13	23 56	24 35	00 35	01 11
30	18 40	19 06	19 38	24 13	00 13	00 49	01 21
35	18 51	19 19	19 54	24 23	00 23	00 57	01 27
40	19 03	19 35	20 14	24 35	00 35	01 06	01 33
45	19 18	19 53	20 39	00 15	00 48	01 16	01 40
S 50	19 37	20 18	21 13	00 35	01 05	01 29	01 49
52	19 46	20 30	21 32	00 44	01 13	01 35	01 53
54	19 56	20 43	21 56	00 55	01 21	01 41	01 58
56	20 07	21 00	22 30	01 07	01 31	01 49	02 03
58	20 20	21 19	////	01 20	01 41	01 57	02 08
S 60	20 35	21 45	////	01 36	01 54	02 06	02 14

Día	SOL E.T. (+) 00h	SOL E.T. (+) 12h	Pas. Mer.	LUNA Pas. Mer. Sup.	LUNA Pas. Mer. Inf.	Edad	Fase
d	m s	m s	h m	h m	h m	d	%
21	14 13	14 05	11 46	17 15	04 51	06	36
22	13 58	13 50	11 46	18 00	05 38	07	46
23	13 42	13 33	11 46	18 44	06 22	08	55

T.U.	ARIES	VENUS −3.9		MARTE +0.4		JUPITER −2.6		SATURNO −0.4	
	A.H.G.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
24 00	63 01.0	195 48.7	S16 34.2	100 53.7	S16 31.3	316 48.9	N22 31.2	351 58.5	N20 23.8
01	78 03.5	210 48.0	35.1	115 54.4	30.7	331 51.6	31.2	7 01.2	23.8
02	93 05.9	225 47.4	36.0	130 55.1	30.1	346 54.2	31.2	22 03.9	23.8
03	108 08.4	240 46.7	. . 37.0	145 55.8	. . 29.5	1 56.9	. . 31.3	37 06.6	. . 23.7
04	123 10.9	255 46.0	37.9	160 56.5	28.8	16 59.5	31.3	52 09.2	23.7
05	138 13.3	270 45.4	38.8	175 57.2	28.2	32 02.2	31.3	67 11.9	23.7
06	153 15.8	285 44.7	S16 39.7	190 57.9	S16 27.6	47 04.9	N22 31.3	82 14.6	N20 23.7
07	168 18.3	300 44.0	40.6	205 58.6	27.0	62 07.5	31.4	97 17.3	23.6
S 08	183 20.7	315 43.3	41.6	220 59.3	26.3	77 10.2	31.4	112 20.0	23.6
A 09	198 23.2	330 42.7	. . 42.5	236 00.0	. . 25.7	92 12.8	. . 31.4	127 22.6	. . 23.6
B 10	213 25.6	345 42.0	43.4	251 00.7	25.1	107 15.5	31.4	142 25.3	23.6
11	228 28.1	0 41.3	44.3	266 01.5	24.5	122 18.1	31.5	157 28.0	23.5
A 12	243 30.6	15 40.6	S16 45.2	281 02.2	S16 23.9	137 20.8	N22 31.5	172 30.7	N20 23.5
D 13	258 33.0	30 40.0	46.1	296 02.9	23.2	152 23.4	31.5	187 33.3	23.5
14	273 35.5	45 39.3	47.0	311 03.6	22.6	167 26.1	31.5	202 36.0	23.5
O 15	288 38.0	60 38.6	. . 47.9	326 04.3	. . 22.0	182 28.7	. . 31.6	217 38.7	. . 23.4
16	303 40.4	75 38.0	48.9	341 05.0	21.4	197 31.4	31.6	232 41.4	23.4
17	318 42.9	90 37.3	49.8	356 05.7	20.7	212 34.1	31.6	247 44.0	23.4
18	333 45.4	105 36.6	S16 50.7	11 06.4	S16 20.1	227 36.7	N22 31.6	262 46.7	N20 23.4
19	348 47.8	120 35.9	51.6	26 07.1	19.5	242 39.4	31.7	277 49.4	23.3
20	3 50.3	135 35.2	52.5	41 07.8	18.9	257 42.0	31.7	292 52.1	23.3
21	18 52.8	150 34.6	. . 53.4	56 08.5	. . 18.2	272 44.7	. . 31.7	307 54.7	. . 23.3
22	33 55.2	165 33.9	54.3	71 09.2	17.6	287 47.3	31.7	322 57.4	23.3
23	48 57.7	180 33.2	55.2	86 09.9	17.0	302 50.0	31.8	338 00.1	23.2
25 00	64 00.1	195 32.5	S16 56.1	101 10.6	S16 16.3	317 52.7	N22 31.8	353 02.8	N20 23.2
01	79 02.6	210 31.9	57.0	116 11.3	15.7	332 55.3	31.8	8 05.5	23.2
02	94 05.1	225 31.2	57.9	131 12.0	15.1	347 58.0	31.8	23 08.1	23.2
03	109 07.5	240 30.5	. . 58.8	146 12.7	. . 14.5	3 00.6	. . 31.9	38 10.8	. . 23.1
04	124 10.0	255 29.8	16 59.7	161 13.4	13.8	18 03.3	31.9	53 13.5	23.1
05	139 12.5	270 29.1	17 00.6	176 14.1	13.2	33 06.0	31.9	68 16.2	23.1
06	154 14.9	285 28.4	S17 01.5	191 14.8	S16 12.6	48 08.6	N22 31.9	83 18.8	N20 23.1
07	169 17.4	300 27.8	02.4	206 15.5	12.0	63 11.3	32.0	98 21.5	23.1
D 08	184 19.9	315 27.1	03.3	221 16.3	11.3	78 13.9	32.0	113 24.2	23.0
O 09	199 22.3	330 26.4	. . 04.2	236 17.0	. . 10.7	93 16.6	. . 32.0	128 26.9	. . 23.0
M 10	214 24.8	345 25.7	05.1	251 17.7	10.1	108 19.3	32.0	143 29.5	23.0
I 11	229 27.2	0 25.0	06.0	266 18.4	09.4	123 21.9	32.1	158 32.2	23.0
N 12	244 29.7	15 24.3	S17 06.9	281 19.1	S16 08.8	138 24.6	N22 32.1	173 34.9	N20 22.9
G 13	259 32.2	30 23.7	07.8	296 19.8	08.2	153 27.3	32.1	188 37.6	22.9
14	274 34.6	45 23.0	08.7	311 20.5	07.5	168 29.9	32.1	203 40.3	22.9
O 15	289 37.1	60 22.3	. . 09.6	326 21.2	. . 06.9	183 32.6	. . 32.2	218 42.9	. . 22.9
16	304 39.6	75 21.6	10.5	341 21.9	06.3	198 35.3	32.2	233 45.6	22.8
17	319 42.0	90 20.9	11.4	356 22.6	05.7	213 37.9	32.2	248 48.3	22.8
18	334 44.5	105 20.2	S17 12.3	11 23.3	S16 05.0	228 40.6	N22 32.2	263 51.0	N20 22.8
19	349 47.0	120 19.5	13.2	26 24.0	04.4	243 43.2	32.3	278 53.6	22.8
20	4 49.4	135 18.8	14.0	41 24.7	03.8	258 45.9	32.3	293 56.3	22.7
21	19 51.9	150 18.1	. . 14.9	56 25.4	. . 03.1	273 48.6	. . 32.3	308 59.0	. . 22.7
22	34 54.4	165 17.5	15.8	71 26.1	02.5	288 51.2	32.3	324 01.7	22.7
23	49 56.8	180 16.8	16.7	86 26.8	01.9	303 53.9	32.4	339 04.4	22.7
26 00	64 59.3	195 16.1	S17 17.6	101 27.6	S16 01.2	318 56.6	N22 32.4	354 07.0	N20 22.6
01	80 01.7	210 15.4	18.5	116 28.3	00.6	333 59.2	32.4	9 09.7	22.6
02	95 04.2	225 14.7	19.4	131 29.0	16 00.0	349 01.9	32.4	24 12.4	22.6
03	110 06.7	240 14.0	. . 20.2	146 29.7	15 59.3	4 04.6	. . 32.5	39 15.1	. . 22.6
04	125 09.1	255 13.3	21.1	161 30.4	58.7	19 07.2	32.5	54 17.7	22.5
05	140 11.6	270 12.6	22.0	176 31.1	58.1	34 09.9	32.5	69 20.4	22.5
06	155 14.1	285 11.9	S17 22.9	191 31.8	S15 57.4	49 12.6	N22 32.5	84 23.1	N20 22.5
07	170 16.5	300 11.2	23.8	206 32.5	56.8	64 15.3	32.6	99 25.8	22.5
08	185 19.0	315 10.5	24.6	221 33.2	56.2	79 17.9	32.6	114 28.5	22.4
L 09	200 21.5	330 09.8	. . 25.5	236 33.9	. . 55.5	94 20.6	. . 32.6	129 31.1	. . 22.4
U 10	215 23.9	345 09.1	26.4	251 34.6	54.9	109 23.3	32.7	144 33.8	22.4
11	230 26.4	0 08.4	27.3	266 35.3	54.3	124 25.9	32.7	159 36.5	22.4
N 12	245 28.9	15 07.7	S17 28.2	281 36.1	S15 53.6	139 28.6	N22 32.7	174 39.2	N20 22.3
E 13	260 31.3	30 07.0	29.0	296 36.8	53.0	154 31.3	32.7	189 41.8	22.3
14	275 33.8	45 06.3	29.9	311 37.5	52.4	169 33.9	32.8	204 44.5	22.3
S 15	290 36.2	60 05.6	. . 30.8	326 38.2	. . 51.7	184 36.6	. . 32.8	219 47.2	. . 22.3
16	305 38.7	75 04.9	31.7	341 38.9	51.1	199 39.3	32.8	234 49.9	22.2
17	320 41.2	90 04.2	32.5	356 39.6	50.4	214 42.0	32.8	249 52.6	22.2
18	335 43.6	105 03.5	S17 33.4	11 40.3	S15 49.8	229 44.6	N22 32.9	264 55.2	N20 22.2
19	350 46.1	120 02.8	34.3	26 41.0	49.2	244 47.3	32.9	279 57.9	22.2
20	5 48.6	135 02.1	35.1	41 41.7	48.5	259 50.0	32.9	295 00.6	22.1
21	20 51.0	150 01.4	. . 36.0	56 42.4	. . 47.9	274 52.7	. . 32.9	310 03.3	. . 22.1
22	35 53.5	165 00.7	36.9	71 43.1	47.3	289 55.3	33.0	325 06.0	22.1
23	50 56.0	180 00.0	37.7	86 43.9	46.6	304 58.0	33.0	340 08.6	22.1
	h m								
Pas. Mer.	19 40.8	v −0.7	d 0.9	v 0.7	d 0.6	v 2.7	d 0.0	v 2.7	d 0.0

ESTRELLAS

Nombre	A.H.S.	Dec.
	° ′	° ′
Acamar	315 24.8	S40 17.9
Achernar	335 33.0	S57 13.9
Acrux	173 20.1	S63 06.2
Adhara	255 19.4	S28 58.3
Aldebaran	290 59.5	N16 30.8
Alioth	166 28.9	N55 56.9
Alkaid	153 06.4	N49 18.2
Al Na'ir	27 55.1	S46 57.4
Alnilam	275 55.3	S 1 12.0
Alphard	218 05.0	S 8 39.8
Alphecca	126 19.1	N26 42.6
Alpheratz	357 52.8	N29 06.1
Altair	62 17.3	N 8 52.4
Ankaa	353 24.4	S42 18.0
Antares	112 37.9	S26 26.1
Arcturus	146 04.3	N19 10.5
Atria	107 48.5	S69 01.8
Avior	234 21.5	S59 30.6
Bellatrix	278 41.5	N 6 21.1
Betelgeuse	271 10.9	N 7 24.5
Canopus	263 59.7	S52 41.6
Capella	280 47.5	N46 00.0
Deneb	49 37.9	N45 17.4
Denebola	182 43.1	N14 33.8
Diphda	349 04.8	S17 58.7
Dubhe	194 02.8	N61 44.3
Elnath	278 23.8	N28 36.5
Eltanin	90 50.9	N51 29.5
Enif	33 56.1	N 9 53.0
Fomalhaut	15 33.9	S29 37.0
Gacrux	172 11.6	S57 07.0
Gienah	176 01.9	S17 32.9
Hadar	149 01.6	S60 22.6
Hamal	328 10.8	N23 28.3
Kaus Aust.	83 56.2	S34 23.1
Kochab	137 20.6	N74 08.8
Markab	13 47.4	N15 13.0
Menkar	314 24.3	N 4 05.8
Menkent	148 18.8	S36 22.5
Miaplacidus	221 41.5	S69 43.1
Mirfak	308 53.0	N49 52.1
Nunki	76 09.9	S26 17.7
Peacock	53 33.8	S56 44.0
Pollux	243 38.6	N28 01.3
Procyon	245 09.0	N 5 13.3
Rasalhague	96 15.2	N12 33.6
Regulus	207 53.2	N11 57.6
Rigel	281 20.5	S 8 11.9
Rigil Kent.	140 05.0	S60 50.3
Sabik	102 23.4	S15 43.6
Schedar	349 50.7	N56 33.0
Shaula	96 34.7	S37 06.3
Sirius	258 41.5	S16 43.0
Spica	158 41.1	S11 10.1
Suhail	222 59.1	S43 26.1
Vega	80 45.5	N38 47.3
Zuben'ubi	137 15.9	S16 02.8

	A.H.S.	Pas. Mer.
	° ′	h m
Venus	131 32.4	10 58
Marte	37 10.5	17 14
Júpiter	253 52.5	2 48
Saturno	289 02.6	0 28

T.U.	SOL				LUNA						
	A.H.G.		Dec.		A.H.G.	v		Dec.		d	P.H.
d h	°	′	°	′	°	′	′	°	′	′	′
24 00	183	21.1	S20	30.9	76	47.1	15.4	S11	23.1	10.9	54.2
01	198	20.9		31.4	91	21.5	15.4	11	12.2	10.9	54.2
02	213	20.7		31.9	105	55.9	15.5	11	01.3	10.9	54.2
03	228	20.5	. .	32.4	120	30.4	15.5	10	50.4	11.0	54.2
04	243	20.4		32.9	135	04.9	15.5	10	39.4	11.1	54.2
05	258	20.2		33.4	149	39.4	15.6	10	28.3	11.1	54.2
06	273	20.0	S20	34.0	164	14.0	15.6	S10	17.2	11.1	54.3
07	288	19.8		34.5	178	48.6	15.6	10	06.1	11.2	54.3
S 08	303	19.6		35.0	193	23.2	15.6	9	54.9	11.2	54.3
A 09	318	19.5	. .	35.5	207	57.8	15.7	9	43.7	11.2	54.3
B 10	333	19.3		36.0	222	32.5	15.7	9	32.5	11.3	54.3
A 11	348	19.1		36.5	237	07.2	15.7	9	21.2	11.3	54.3
D 12	3	18.9	S20	37.0	251	41.9	15.7	S 9	09.9	11.4	54.3
13	18	18.7		37.5	266	16.6	15.8	8	58.5	11.4	54.3
O 14	33	18.5		38.0	280	51.4	15.7	8	47.1	11.5	54.3
15	48	18.4	. .	38.5	295	26.1	15.8	8	35.6	11.4	54.3
16	63	18.2		39.0	310	00.9	15.8	8	24.2	11.5	54.3
17	78	18.0		39.5	324	35.7	15.9	8	12.7	11.6	54.3
18	93	17.8	S20	39.9	339	10.6	15.8	S 8	01.1	11.6	54.3
19	108	17.6		40.4	353	45.4	15.9	7	49.5	11.6	54.3
20	123	17.4		40.9	8	20.3	15.8	7	37.9	11.7	54.3
21	138	17.2	. .	41.4	22	55.1	15.9	7	26.2	11.6	54.4
22	153	17.1		41.9	37	30.0	15.9	7	14.6	11.8	54.4
23	168	16.9		42.4	52	04.9	15.9	7	02.8	11.7	54.4
25 00	183	16.7	S20	42.9	66	39.8	15.9	S 6	51.1	11.8	54.4
01	198	16.5		43.4	81	14.7	16.0	6	39.3	11.8	54.4
02	213	16.3		43.9	95	49.7	15.9	6	27.5	11.8	54.4
03	228	16.1	. .	44.4	110	24.6	16.0	6	15.7	11.9	54.4
04	243	15.9		44.9	124	59.6	15.9	6	03.8	11.9	54.4
05	258	15.7		45.4	139	34.5	16.0	5	51.9	11.9	54.4
06	273	15.6	S20	45.8	154	09.5	16.0	S 5	40.0	12.0	54.4
07	288	15.4		46.3	168	44.5	15.9	5	28.0	12.0	54.5
D 08	303	15.2		46.8	183	19.4	16.0	5	16.0	12.0	54.5
O 09	318	15.0	. .	47.3	197	54.4	16.0	5	04.0	12.0	54.5
M 10	333	14.8		47.8	212	29.4	16.0	4	52.0	12.1	54.5
I 11	348	14.6		48.3	227	04.4	16.0	4	39.9	12.1	54.5
12	3	14.4	S20	48.8	241	39.4	16.0	S 4	27.8	12.1	54.5
N 13	18	14.2		49.2	256	14.4	16.0	4	15.7	12.1	54.5
G 14	33	14.0		49.7	270	49.4	15.9	4	03.6	12.1	54.5
15	48	13.8	. .	50.2	285	24.3	16.0	3	51.5	12.2	54.6
O 16	63	13.6		50.7	299	59.3	16.0	3	39.3	12.2	54.6
17	78	13.5		51.2	314	34.3	16.0	3	27.1	12.2	54.6
18	93	13.3	S20	51.7	329	09.3	15.9	S 3	14.9	12.3	54.6
19	108	13.1		52.1	343	44.2	16.0	3	02.6	12.2	54.6
20	123	12.9		52.6	358	19.2	16.0	2	50.4	12.3	54.6
21	138	12.7	. .	53.1	12	54.2	15.9	2	38.1	12.3	54.6
22	153	12.5		53.6	27	29.1	15.9	2	25.8	12.3	54.7
23	168	12.3		54.0	42	04.0	16.0	2	13.5	12.3	54.7
26 00	183	12.1	S20	54.5	56	39.0	15.9	S 2	01.2	12.4	54.7
01	198	11.9		55.0	71	13.9	15.9	1	48.8	12.3	54.7
02	213	11.7		55.5	85	48.8	15.9	1	36.5	12.4	54.7
03	228	11.5	. .	55.9	100	23.7	15.9	1	24.1	12.4	54.7
04	243	11.3		56.4	114	58.6	15.8	1	11.7	12.4	54.7
05	258	11.1		56.9	129	33.4	15.9	0	59.3	12.4	54.8
06	273	10.9	S20	57.4	144	08.3	15.8	S 0	46.9	12.4	54.8
07	288	10.7		57.8	158	43.1	15.8	0	34.5	12.4	54.8
L 08	303	10.5		58.3	173	17.9	15.8	0	22.1	12.5	54.8
U 09	318	10.3	. .	58.8	187	52.7	15.8	S 0	09.6	12.4	54.8
N 10	333	10.1		59.2	202	27.5	15.7	N 0	02.8	12.5	54.9
E 11	348	09.9	20	59.7	217	02.2	15.7	0	15.3	12.5	54.9
S 12	3	09.7	S21	00.2	231	36.9	15.8	N 0	27.8	12.4	54.9
13	18	09.5		00.6	246	11.7	15.6	0	40.2	12.5	54.9
14	33	09.3		01.1	260	46.3	15.7	0	52.7	12.5	54.9
15	48	09.1	. .	01.6	275	21.0	15.6	1	05.2	12.5	54.9
16	63	08.9		02.0	289	55.6	15.6	1	17.7	12.5	55.0
17	78	08.7		02.5	304	30.2	15.6	1	30.2	12.5	55.0
18	93	08.5	S21	03.0	319	04.8	15.6	N 1	42.7	12.5	55.0
19	108	08.3		03.4	333	39.4	15.5	1	55.2	12.6	55.0
20	123	08.1		03.9	348	13.9	15.5	2	07.8	12.5	55.0
21	138	07.9	. .	04.4	2	48.4	15.4	2	20.3	12.5	55.1
22	153	07.7		04.8	17	22.8	15.5	2	32.8	12.5	55.1
23	168	07.5		05.3	31	57.3	15.4	N 2	45.3	12.5	55.1
	SD	16.2	d	0.5	SD		14.8		14.9		15.0

Lat.	Crepúsculo Náutico	Crepúsculo Civil	Orto Sol	Orto Luna 24	Orto Luna 25	Orto Luna 26	Orto Luna 27
°	h m	h m	h m	h m	h m	h m	h m
N 72	07 33	09 22	▬	15 10	14 48	14 27	14 06
N 70	07 19	08 50	11 35	14 58	14 42	14 28	14 14
68	07 08	08 26	10 03	14 47	14 38	14 29	14 20
66	06 58	08 08	09 25	14 39	14 34	14 30	14 26
64	06 50	07 53	08 59	14 31	14 31	14 31	14 30
62	06 42	07 41	08 39	14 25	14 28	14 31	14 34
60	06 36	07 30	08 22	14 20	14 26	14 32	14 38
N 58	06 30	07 20	08 08	14 15	14 24	14 32	14 41
56	06 25	07 12	07 56	14 10	14 22	14 33	14 44
54	06 20	07 05	07 46	14 06	14 20	14 33	14 47
52	06 15	06 58	07 37	14 03	14 18	14 33	14 49
50	06 11	06 52	07 28	14 00	14 17	14 34	14 51
45	06 02	06 38	07 11	13 53	14 14	14 34	14 56
N 40	05 53	06 27	06 56	13 47	14 11	14 35	15 00
35	05 46	06 17	06 44	13 42	14 09	14 36	15 03
30	05 38	06 08	06 33	13 37	14 07	14 36	15 06
20	05 24	05 51	06 15	13 29	14 03	14 37	15 12
N 10	05 10	05 36	05 59	13 22	14 00	14 38	15 16
0	04 56	05 21	05 43	13 16	13 57	14 38	15 21
S 10	04 39	05 05	05 28	13 09	13 54	14 39	15 25
20	04 19	04 47	05 11	13 02	13 51	14 40	15 30
30	03 53	04 26	04 52	12 54	13 47	14 41	15 36
35	03 37	04 12	04 41	12 50	13 45	14 41	15 39
40	03 17	03 56	04 28	12 44	13 43	14 42	15 43
45	02 51	03 37	04 12	12 38	13 40	14 43	15 47
S 50	02 16	03 12	03 53	12 31	13 37	14 44	15 52
52	01 56	03 00	03 44	12 27	13 35	14 44	15 54
54	01 31	02 46	03 34	12 24	13 34	14 45	15 57
56	00 53	02 29	03 22	12 19	13 32	14 45	16 00
58	////	02 08	03 09	12 15	13 30	14 46	16 03
S 60	////	01 41	02 53	12 10	13 28	14 46	16 07

Lat.	Ocaso Sol	Crepúsculo Civil	Crepúsculo Náutico	Ocaso Luna 24	Ocaso Luna 25	Ocaso Luna 26	Ocaso Luna 27
°	h m	h m	h m	h m	h m	h m	h m
N 72	▬	14 11	16 00	24 06	00 06	01 55	03 45
N 70	11 58	14 43	16 14	24 16	00 16	01 58	03 40
68	13 30	15 07	16 25	24 25	00 25	02 00	03 36
66	14 08	15 25	16 35	24 32	00 32	02 01	03 32
64	14 35	15 40	16 44	24 38	00 38	02 03	03 29
62	14 55	15 53	16 51	24 43	00 43	02 04	03 27
60	15 11	16 04	16 57	24 47	00 47	02 05	03 24
N 58	15 25	16 13	17 03	24 51	00 51	02 06	03 22
56	15 37	16 22	17 09	24 54	00 54	02 07	03 21
54	15 48	16 29	17 14	24 57	00 57	02 08	03 19
52	15 57	16 36	17 18	25 00	01 00	02 08	03 18
50	16 05	16 42	17 22	25 03	01 03	02 09	03 16
45	16 23	16 56	17 32	00 06	01 08	02 10	03 13
N 40	16 37	17 07	17 40	00 14	01 13	02 11	03 11
35	16 50	17 17	17 48	00 21	01 16	02 12	03 09
30	17 00	17 26	17 56	00 27	01 20	02 13	03 07
20	17 19	17 43	18 10	00 37	01 26	02 14	03 04
N 10	17 35	17 58	18 24	00 46	01 31	02 16	03 01
0	17 51	18 13	18 39	00 54	01 36	02 17	02 59
S 10	18 06	18 29	18 55	01 02	01 40	02 18	02 56
20	18 23	18 47	19 15	01 11	01 45	02 19	02 53
30	18 42	19 09	19 41	01 21	01 51	02 20	02 50
35	18 54	19 22	19 58	01 27	01 54	02 21	02 48
40	19 07	19 38	20 18	01 33	01 58	02 22	02 46
45	19 22	19 58	20 44	01 40	02 02	02 23	02 44
S 50	19 42	20 23	21 20	01 49	02 07	02 24	02 41
52	19 51	20 35	21 40	01 53	02 09	02 25	02 40
54	20 01	20 50	22 06	01 58	02 12	02 25	02 38
56	20 13	21 07	22 46	02 03	02 15	02 26	02 37
58	20 26	21 28	////	02 08	02 18	02 26	02 35
S 60	20 42	21 56	////	02 14	02 21	02 27	02 33

Día	SOL E.T. (+) 00h	SOL E.T. (+) 12h	SOL Pas. Mer.	LUNA Pas. Sup.	LUNA Mer. Inf.	LUNA Edad	LUNA Fase
d	m s	m s	h m	h m	h m	d	%
24	13 25	13 16	11 47	19 26	07 05	09	64
25	13 07	12 58	11 47	20 07	07 46	10	73
26	12 49	12 39	11 47	20 48	08 28	11	81

(MAR., MIE., JUE.) 27, 28, 29 NOVIEMBRE DEL 2001

T.U.	ARIES	VENUS −3.9		MARTE +0.4		JUPITER −2.6		SATURNO −0.4		ESTRELLAS		
	A.H.G.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.	Nombre	A.H.S.	Dec.
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′		° ′	° ′
27 00	65 58.4	194 59.3	S17 38.6	101 44.6	S15 46.0	320 00.7	N22 33.0	355 11.3	N20 22.1	Acamar	315 24.8	S40 18.0
01	81 00.9	209 58.6	39.5	116 45.3	45.3	335 03.4	33.1	10 14.0	22.0	Achernar	335 33.0	S57 13.9
02	96 03.3	224 57.9	40.3	131 46.0	44.7	350 06.0	33.1	25 16.7	22.0	Acrux	173 20.0	S63 06.2
03	111 05.8	239 57.2	41.2	146 46.7	44.1	5 08.7	33.1	40 19.3	22.0	Adhara	255 19.4	S28 58.3
04	126 08.3	254 56.5	42.1	161 47.4	43.4	20 11.4	33.1	55 22.0	22.0	Aldebaran	290 59.5	N16 30.8
05	141 10.7	269 55.8	42.9	176 48.1	42.8	35 14.1	33.2	70 24.7	21.9			
06	156 13.2	284 55.1	S17 43.8	191 48.8	S15 42.2	50 16.7	N22 33.2	85 27.4	N20 21.9	Alioth	166 28.9	N55 56.9
07	171 15.7	299 54.4	44.6	206 49.5	41.5	65 19.4	33.2	100 30.1	21.9	Alkaid	153 06.4	N49 18.2
M 08	186 18.1	314 53.7	45.5	221 50.2	40.9	80 22.1	33.2	115 32.7	21.9	Al Na'ir	27 55.1	S46 57.4
A 09	201 20.6	329 52.9	46.4	236 51.0	40.2	95 24.8	33.3	130 35.4	21.8	Alnilam	275 55.3	S 1 12.0
R 10	216 23.1	344 52.2	47.2	251 51.7	39.6	110 27.4	33.3	145 38.1	21.8	Alphard	218 05.0	S 8 39.8
T 11	231 25.5	359 51.5	48.1	266 52.4	39.0	125 30.1	33.3	160 40.8	21.8			
12	246 28.0	14 50.8	S17 48.9	281 53.1	S15 38.3	140 32.8	N22 33.3	175 43.5	N20 21.8	Alphecca	126 19.1	N26 42.6
E 13	261 30.5	29 50.1	49.8	296 53.8	37.7	155 35.5	33.4	190 46.1	21.7	Alpheratz	357 52.8	N29 06.1
14	276 32.9	44 49.4	50.6	311 54.5	37.0	170 38.2	33.4	205 48.8	21.7	Altair	62 17.3	N 8 52.4
S 15	291 35.4	59 48.7	51.5	326 55.2	36.4	185 40.8	33.4	220 51.5	21.7	Ankaa	353 24.4	S42 18.0
16	306 37.8	74 48.0	52.4	341 55.9	35.7	200 43.5	33.5	235 54.2	21.7	Antares	112 37.9	S26 26.1
17	321 40.3	89 47.3	53.2	356 56.6	35.1	215 46.2	33.5	250 56.9	21.6			
18	336 42.8	104 46.5	S17 54.1	11 57.4	S15 34.5	230 48.9	N22 33.5	265 59.5	N20 21.6	Arcturus	146 04.3	N19 10.4
19	351 45.2	119 45.8	54.9	26 58.1	33.8	245 51.6	33.5	281 02.2	21.6	Atria	107 48.5	S69 01.8
20	6 47.7	134 45.1	55.8	41 58.8	33.2	260 54.2	33.6	296 04.9	21.6	Avior	234 21.5	S59 30.6
21	21 50.2	149 44.4	56.6	56 59.5	32.5	275 56.9	33.6	311 07.6	21.5	Bellatrix	278 41.5	N 6 21.1
22	36 52.6	164 43.7	57.5	72 00.2	31.9	290 59.6	33.6	326 10.3	21.5	Betelgeuse	271 10.8	N 7 24.5
23	51 55.1	179 43.0	58.3	87 00.9	31.3	306 02.3	33.6	341 12.9	21.5			
28 00	66 57.6	194 42.3	S17 59.1	102 01.6	S15 30.6	321 05.0	N22 33.7	356 15.6	N20 21.5	Canopus	263 59.7	S52 41.6
01	82 00.0	209 41.5	18 00.0	117 02.3	30.0	336 07.6	33.7	11 18.3	21.4	Capella	280 47.5	N46 00.0
02	97 02.5	224 40.8	00.8	132 03.1	29.3	351 10.3	33.7	26 21.0	21.4	Deneb	49 38.0	N45 17.4
03	112 05.0	239 40.1	01.7	147 03.8	28.7	6 13.0	33.8	41 23.6	21.4	Denebola	182 43.0	N14 33.8
04	127 07.4	254 39.4	02.5	162 04.5	28.0	21 15.7	33.8	56 26.3	21.4	Diphda	349 04.8	S17 58.7
05	142 09.9	269 38.7	03.4	177 05.2	27.4	36 18.4	33.8	71 29.0	21.3			
06	157 12.3	284 37.9	S18 04.2	192 05.9	S15 26.7	51 21.1	N22 33.8	86 31.7	N20 21.3	Dubhe	194 02.8	N61 44.3
M 07	172 14.8	299 37.2	05.0	207 06.6	26.1	66 23.8	33.9	101 34.4	21.3	Elnath	278 23.8	N28 36.5
I 08	187 17.3	314 36.5	05.9	222 07.3	25.5	81 26.4	33.9	116 37.0	21.3	Eltanin	90 50.9	N51 29.5
E 09	202 19.7	329 35.8	06.7	237 08.0	24.8	96 29.1	33.9	131 39.7	21.2	Enif	33 56.1	N 9 53.0
R 10	217 22.2	344 35.1	07.6	252 08.8	24.2	111 31.8	33.9	146 42.4	21.2	Fomalhaut	15 33.9	S29 37.0
C 11	232 24.7	359 34.3	08.4	267 09.5	23.5	126 34.5	34.0	161 45.1	21.2			
O 12	247 27.1	14 33.6	S18 09.2	282 10.2	S15 22.9	141 37.2	N22 34.0	176 47.8	N20 21.2	Gacrux	172 11.5	S57 07.0
L 13	262 29.6	29 32.9	10.1	297 10.9	22.2	156 39.9	34.0	191 50.4	21.1	Gienah	176 01.9	S17 32.9
E 14	277 32.1	44 32.2	10.9	312 11.6	21.6	171 42.6	34.1	206 53.1	21.1	Hadar	149 01.5	S60 22.6
S 15	292 34.5	59 31.4	11.7	327 12.3	20.9	186 45.2	34.1	221 55.8	21.1	Hamal	328 10.8	N23 28.3
16	307 37.0	74 30.7	12.6	342 13.0	20.3	201 47.9	34.1	236 58.5	21.1	Kaus Aust.	83 56.3	S34 23.1
17	322 39.4	89 30.0	13.4	357 13.8	19.6	216 50.6	34.1	252 01.2	21.1			
18	337 41.9	104 29.3	S18 14.2	12 14.5	S15 19.0	231 53.3	N22 34.2	267 03.8	N20 21.0	Kochab	137 20.6	N74 08.8
19	352 44.4	119 28.5	15.1	27 15.2	18.3	246 56.0	34.2	282 06.5	21.0	Markab	13 47.4	N15 13.0
20	7 46.8	134 27.8	15.9	42 15.9	17.7	261 58.7	34.2	297 09.2	21.0	Menkar	314 24.3	N 4 05.8
21	22 49.3	149 27.1	16.7	57 16.6	17.0	277 01.4	34.3	312 11.9	21.0	Menkent	148 18.7	S36 22.5
22	37 51.8	164 26.4	17.5	72 17.3	16.4	292 04.1	34.3	327 14.6	20.9	Miaplacidus	221 41.4	S69 43.1
23	52 54.2	179 25.6	18.4	87 18.0	15.7	307 06.7	34.3	342 17.2	20.9			
29 00	67 56.7	194 24.9	S18 19.2	102 18.8	S15 15.1	322 09.4	N22 34.3	357 19.9	N20 20.9	Mirfak	308 53.0	N49 52.1
01	82 59.2	209 24.2	20.0	117 19.5	14.5	337 12.1	34.4	12 22.6	20.9	Nunki	76 09.9	S26 17.7
02	98 01.6	224 23.4	20.8	132 20.2	13.8	352 14.8	34.4	27 25.3	20.8	Peacock	53 33.8	S56 44.0
03	113 04.1	239 22.7	21.7	147 20.9	13.2	7 17.5	34.4	42 28.0	20.8	Pollux	243 38.6	N28 01.3
04	128 06.6	254 22.0	22.5	162 21.6	12.5	22 20.2	34.4	57 30.6	20.8	Procyon	245 09.0	N 5 13.3
05	143 09.0	269 21.2	23.3	177 22.3	11.9	37 22.9	34.5	72 33.3	20.8			
06	158 11.5	284 20.5	S18 24.1	192 23.0	S15 11.2	52 25.6	N22 34.5	87 36.0	N20 20.7	Rasalhague	96 15.2	N12 33.6
07	173 13.9	299 19.8	25.0	207 23.8	10.6	67 28.3	34.5	102 38.7	20.7	Regulus	207 53.2	N11 57.6
J 08	188 16.4	314 19.0	25.8	222 24.5	09.9	82 31.0	34.6	117 41.4	20.7	Rigel	281 20.5	S 8 11.9
U 09	203 18.9	329 18.3	26.6	237 25.2	09.3	97 33.7	34.6	132 44.0	20.7	Rigil Kent.	140 05.0	S60 50.3
E 10	218 21.3	344 17.6	27.4	252 25.9	08.6	112 36.4	34.6	147 46.7	20.6	Sabik	102 23.4	S15 43.6
V 11	233 23.8	359 16.8	28.2	267 26.6	08.0	127 39.0	34.6	162 49.4	20.6			
12	248 26.3	14 16.1	S18 29.0	282 27.3	S15 07.3	142 41.7	N22 34.7	177 52.1	N20 20.6	Schedar	349 50.7	N56 33.0
E 13	263 28.7	29 15.4	29.9	297 28.1	06.6	157 44.4	34.7	192 54.8	20.6	Shaula	96 34.7	S37 06.3
14	278 31.2	44 14.6	30.7	312 28.8	06.0	172 47.1	34.7	207 57.4	20.5	Sirius	258 41.5	S16 43.0
S 15	293 33.7	59 13.9	31.5	327 29.5	05.3	187 49.8	34.8	223 00.1	20.5	Spica	158 41.1	S11 10.1
16	308 36.1	74 13.2	32.3	342 30.2	04.7	202 52.5	34.8	238 02.8	20.5	Suhail	222 59.0	S43 26.1
17	323 38.6	89 12.4	33.1	357 30.9	04.0	217 55.2	34.8	253 05.5	20.5			
18	338 41.1	104 11.7	S18 33.9	12 31.6	S15 03.4	232 57.9	N22 34.8	268 08.2	N20 20.4	Vega	80 45.5	N38 47.3
19	353 43.5	119 10.9	34.7	27 32.4	02.7	248 00.6	34.9	283 10.8	20.4	Zuben'ubi	137 15.9	S16 02.8
20	8 46.0	134 10.2	35.5	42 33.1	02.1	263 03.3	34.9	298 13.5	20.4			
21	23 48.4	149 09.5	36.3	57 33.8	01.4	278 06.0	34.9	313 16.2	20.4		A.H.S.	Pas. Mer.
22	38 50.9	164 08.7	37.1	72 34.5	00.8	293 08.7	35.0	328 18.9	20.3		° ′	h m
23	53 53.4	179 08.0	38.0	87 35.2	00.1	308 11.4	35.0	343 21.6	20.3	Venus	127 44.7	11 02
	h m									Marte	35 04.1	17 11
Pas. Mer.	19 29.0	v −0.7	d 0.8	v 0.7	d 0.6	v 2.7	d 0.0	v 2.7	d 0.0	Júpiter	254 07.4	2 35
										Saturno	289 18.1	0 15

(MAR., MIE., JUE.) 27, 28, 29 NOVIEMBRE DEL 2001

T.U.	SOL				LUNA						
	A.H.G.		Dec.		A.H.G.	v		Dec.	d	P.H.	
d h	°	′	°	′	°	′	′	°	′	′	′
27 00	183	07.3	S21	05.7	46	31.7	15.3	N 2	57.8	12.5	55.1
01	198	07.1		06.2	61	06.0	15.4	3	10.3	12.6	55.1
02	213	06.9		06.7	75	40.4	15.2	3	22.9	12.5	55.2
03	228	06.7	. .	07.1	90	14.6	15.3	3	35.4	12.5	55.2
04	243	06.5		07.6	104	48.9	15.2	3	47.9	12.5	55.2
05	258	06.3		08.0	119	23.1	15.2	4	00.4	12.5	55.2
06	273	06.1	S21	08.5	133	57.3	15.1	N 4	12.9	12.5	55.3
07	288	05.9		08.9	148	31.4	15.1	4	25.4	12.5	55.3
M 08	303	05.7		09.4	163	05.5	15.1	4	37.9	12.4	55.3
A 09	318	05.5	. .	09.8	177	39.6	15.0	4	50.3	12.5	55.3
R 10	333	05.3		10.3	192	13.6	14.9	5	02.8	12.5	55.3
11	348	05.1		10.7	206	47.5	15.0	5	15.3	12.4	55.4
T 12	3	04.9	S21	11.2	221	21.5	14.8	N 5	27.7	12.5	55.4
13	18	04.7		11.6	235	55.3	14.9	5	40.2	12.4	55.4
E 14	33	04.5		12.1	250	29.2	14.7	5	52.6	12.4	55.4
S 15	48	04.3	. .	12.5	265	02.9	14.8	6	05.0	12.4	55.5
16	63	04.1		13.0	279	36.7	14.6	6	17.4	12.4	55.5
17	78	03.8		13.4	294	10.3	14.7	6	29.8	12.4	55.5
18	93	03.6	S21	13.9	308	44.0	14.6	N 6	42.2	12.3	55.5
19	108	03.4		14.3	323	17.6	14.5	6	54.5	12.3	55.5
20	123	03.2		14.8	337	51.1	14.5	7	06.8	12.4	55.6
21	138	03.0	. .	15.2	352	24.6	14.4	7	19.2	12.3	55.6
22	153	02.8		15.7	6	58.0	14.4	7	31.5	12.2	55.6
23	168	02.6		16.1	21	31.4	14.3	7	43.7	12.3	55.6
28 00	183	02.4	S21	16.6	36	04.7	14.2	N 7	56.0	12.2	55.7
01	198	02.2		17.0	50	37.9	14.2	8	08.2	12.3	55.7
02	213	02.0		17.4	65	11.1	14.1	8	20.5	12.1	55.7
03	228	01.8	. .	17.9	79	44.2	14.1	8	32.6	12.2	55.7
04	243	01.5		18.3	94	17.3	14.0	8	44.8	12.1	55.8
05	258	01.3		18.8	108	50.3	14.0	8	56.9	12.2	55.8
06	273	01.1	S21	19.2	123	23.3	13.9	N 9	09.1	12.0	55.8
M 07	288	00.9		19.6	137	56.2	13.8	9	21.1	12.1	55.8
I 08	303	00.7		20.1	152	29.0	13.8	9	33.2	12.0	55.9
E 09	318	00.5	. .	20.5	167	01.8	13.7	9	45.2	12.0	55.9
R 10	333	00.3		20.9	181	34.5	13.6	9	57.2	12.0	55.9
C 11	348	00.1		21.4	196	07.1	13.6	10	09.2	11.9	55.9
O 12	2	59.8	S21	21.8	210	39.7	13.5	N10	21.1	11.9	56.0
L 13	17	59.6		22.2	225	12.2	13.4	10	33.0	11.9	56.0
E 14	32	59.4		22.7	239	44.6	13.4	10	44.9	11.8	56.0
S 15	47	59.2	. .	23.1	254	17.0	13.3	10	56.7	11.8	56.0
16	62	59.0		23.5	268	49.3	13.2	11	08.5	11.7	56.1
17	77	58.8		24.0	283	21.5	13.2	11	20.2	11.7	56.1
18	92	58.6	S21	24.4	297	53.7	13.0	N11	31.9	11.7	56.1
19	107	58.3		24.8	312	25.7	13.1	11	43.6	11.6	56.1
20	122	58.1		25.3	326	57.8	12.9	11	55.2	11.6	56.2
21	137	57.9	. .	25.7	341	29.7	12.9	12	06.8	11.5	56.2
22	152	57.7		26.1	356	01.6	12.7	12	18.3	11.5	56.2
23	167	57.5		26.5	10	33.3	12.7	12	29.8	11.5	56.3
29 00	182	57.3	S21	27.0	25	05.0	12.7	N12	41.3	11.4	56.3
01	197	57.1		27.4	39	36.7	12.5	12	52.7	11.3	56.3
02	212	56.8		27.8	54	08.2	12.5	13	04.0	11.3	56.3
03	227	56.6	. .	28.2	68	39.7	12.4	13	15.3	11.3	56.4
04	242	56.4		28.7	83	11.1	12.3	13	26.6	11.2	56.4
05	257	56.2		29.1	97	42.4	12.3	13	37.8	11.1	56.4
06	272	56.0	S21	29.5	112	13.7	12.1	N13	48.9	11.1	56.4
07	287	55.7		29.9	126	44.8	12.1	14	00.0	11.0	56.5
J 08	302	55.5		30.4	141	15.9	12.0	14	11.0	11.0	56.5
U 09	317	55.3	. .	30.8	155	46.9	11.9	14	22.0	10.9	56.5
E 10	332	55.1		31.2	170	17.8	11.9	14	32.9	10.9	56.5
V 11	347	54.9		31.6	184	48.7	11.7	14	43.8	10.8	56.6
E 12	2	54.6	S21	32.0	199	19.4	11.7	N14	54.6	10.7	56.6
S 13	17	54.4		32.4	213	50.1	11.6	15	05.3	10.7	56.6
14	32	54.2		32.9	228	20.7	11.5	15	16.0	10.6	56.6
15	47	54.0	. .	33.3	242	51.2	11.4	15	26.6	10.5	56.7
16	62	53.8		33.7	257	21.6	11.3	15	37.1	10.5	56.7
17	77	53.5		34.1	271	51.9	11.2	15	47.6	10.4	56.7
18	92	53.3	S21	34.5	286	22.1	11.2	N15	58.0	10.3	56.8
19	107	53.1		34.9	300	52.3	11.0	16	08.3	10.3	56.8
20	122	52.9		35.3	315	22.3	11.0	16	18.6	10.2	56.8
21	137	52.7	. .	35.8	329	52.3	10.9	16	28.8	10.1	56.8
22	152	52.4		36.2	344	22.2	10.8	16	38.9	10.0	56.9
23	167	52.2		36.6	358	52.0	10.7	N16	48.9	10.0	56.9
	SD	16.2	d	0.4	SD	15.1		15.3		15.4	

Lat.	Crepúsculo Náutico	Crepúsculo Civil	Orto Sol	Orto Luna 27	Orto Luna 28	Orto Luna 29	Orto Luna 30
°	h m	h m	h m	h m	h m	h m	h m
N 72	07 43	09 36	▬	14 06	13 40	13 03	▭
N 70	07 27	09 01	▬	14 14	13 57	13 35	12 54
68	07 15	08 35	10 19	14 20	14 10	13 58	13 41
66	07 05	08 16	09 36	14 26	14 21	14 17	14 12
64	06 56	08 00	09 08	14 30	14 31	14 32	14 36
62	06 48	07 47	08 46	14 34	14 39	14 45	14 54
60	06 41	07 35	08 29	14 38	14 45	14 55	15 10
N 58	06 35	07 26	08 14	14 41	14 52	15 05	15 23
56	06 29	07 17	08 02	14 44	14 57	15 13	15 34
54	06 24	07 09	07 51	14 47	15 02	15 20	15 44
52	06 19	07 02	07 41	14 49	15 06	15 27	15 53
50	06 15	06 56	07 33	14 51	15 10	15 33	16 01
45	06 05	06 42	07 14	14 56	15 19	15 46	16 18
N 40	05 56	06 30	07 00	15 00	15 27	15 57	16 32
35	05 48	06 19	06 47	15 03	15 33	16 06	16 44
30	05 40	06 10	06 36	15 06	15 39	16 14	16 55
20	05 26	05 53	06 17	15 12	15 48	16 29	17 13
N 10	05 12	05 38	06 00	15 16	15 57	16 41	17 29
0	04 56	05 22	05 44	15 21	16 05	16 53	17 44
S 10	04 39	05 06	05 28	15 25	16 14	17 05	17 59
20	04 19	04 47	05 11	15 30	16 22	17 17	18 15
30	03 52	04 25	04 52	15 36	16 33	17 32	18 34
35	03 36	04 11	04 40	15 39	16 39	17 41	18 45
40	03 15	03 55	04 27	15 43	16 45	17 50	18 57
45	02 48	03 35	04 11	15 47	16 53	18 02	19 12
S 50	02 11	03 09	03 51	15 52	17 03	18 16	19 31
52	01 50	02 56	03 41	15 54	17 07	18 22	19 39
54	01 23	02 41	03 31	15 57	17 12	18 30	19 49
56	00 38	02 23	03 19	16 00	17 18	18 38	20 00
58	////	02 01	03 05	16 03	17 24	18 47	20 13
S 60	////	01 32	02 48	16 07	17 31	18 58	20 28

Lat.	Ocaso Sol	Crepúsculo Civil	Crepúsculo Náutico	Ocaso Luna 27	Ocaso Luna 28	Ocaso Luna 29	Ocaso Luna 30
°	h m	h m	h m	h m	h m	h m	h m
N 72	▬	13 59	15 53	03 45	05 42	07 56	▭
N 70	▬	14 35	16 08	03 40	05 28	07 26	09 52
68	13 16	15 00	16 20	03 36	05 16	07 04	09 05
66	13 59	15 20	16 31	03 32	05 07	06 47	08 35
64	14 28	15 35	16 40	03 29	04 59	06 33	08 12
62	14 49	15 49	16 47	03 27	04 52	06 21	07 55
60	15 07	16 00	16 54	03 24	04 46	06 12	07 40
N 58	15 21	16 10	17 01	03 22	04 41	06 03	07 27
56	15 34	16 19	17 06	03 21	04 37	05 55	07 17
54	15 45	16 27	17 11	03 19	04 33	05 49	07 07
52	15 54	16 34	17 16	03 18	04 29	05 43	06 59
50	16 03	16 40	17 21	03 16	04 26	05 37	06 51
45	16 21	16 54	17 31	03 13	04 18	05 26	06 35
N 40	16 36	17 06	17 40	03 11	04 12	05 16	06 22
35	16 49	17 16	17 48	03 09	04 07	05 08	06 11
30	17 00	17 26	17 55	03 07	04 03	05 01	06 01
20	17 19	17 43	18 10	03 04	03 55	04 48	05 45
N 10	17 36	17 58	18 24	03 01	03 48	04 38	05 30
0	17 52	18 14	18 40	02 59	03 42	04 28	05 17
S 10	18 08	18 30	18 57	02 56	03 35	04 18	05 03
20	18 25	18 49	19 18	02 53	03 29	04 07	04 49
30	18 45	19 12	19 44	02 50	03 21	03 55	04 33
35	18 56	19 25	20 01	02 48	03 17	03 48	04 23
40	19 10	19 42	20 22	02 46	03 12	03 40	04 12
45	19 26	20 02	20 49	02 44	03 06	03 31	04 00
S 50	19 46	20 28	21 27	02 41	02 59	03 20	03 44
52	19 55	20 41	21 48	02 40	02 56	03 15	03 37
54	20 06	20 56	22 16	02 38	02 52	03 09	03 29
56	20 18	21 14	23 04	02 37	02 49	03 03	03 21
58	20 33	21 37	////	02 35	02 44	02 56	03 11
S 60	20 49	22 07	////	02 33	02 40	02 48	02 59

Día	SOL E.T. (+) 00h	SOL E.T. (+) 12h	Pas. Mer.	LUNA Pas. Mer. Sup.	LUNA Pas. Mer. Inf.	LUNA Edad	LUNA Fase
d	m s	m s	h m	h m	h m	d %	
27	12 30	12 20	11 48	21 31	09 10	12 88	
28	12 10	12 00	11 48	22 16	09 54	13 94	◯
29	11 50	11 39	11 48	23 05	10 40	14 98	

T.U.	ARIES	VENUS −3.9		MARTE +0.4		JUPITER −2.6		SATURNO −0.4	
d h	A.H.G.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.
	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
30 00	68 55.8	194 07.2	S18 38.8	102 35.9	S14 59.5	323 14.1	N22 35.0	358 24.3	N20 20.3
01	83 58.3	209 06.5	39.6	117 36.7	58.8	338 16.8	35.0	13 26.9	20.3
02	99 00.8	224 05.7	40.4	132 37.4	58.2	353 19.5	35.1	28 29.6	20.2
03	114 03.2	239 05.0	41.2	147 38.1	57.5	8 22.2	35.1	43 32.3	20.2
04	129 05.7	254 04.3	42.0	162 38.8	56.9	23 24.9	35.1	58 35.0	20.2
05	144 08.2	269 03.5	42.8	177 39.5	56.2	38 27.6	35.2	73 37.7	20.2
06	159 10.6	284 02.8	S18 43.6	192 40.2	S14 55.5	53 30.3	N22 35.2	88 40.3	N20 20.1
07	174 13.1	299 02.0	44.4	207 41.0	54.9	68 33.0	35.2	103 43.0	20.1
V 08	189 15.5	314 01.3	45.2	222 41.7	54.2	83 35.7	35.2	118 45.7	20.1
I 09	204 18.0	329 00.5	46.0	237 42.4	53.6	98 38.4	35.3	133 48.4	20.1
E 10	219 20.5	343 59.8	46.8	252 43.1	52.9	113 41.1	35.3	148 51.1	20.1
R 11	234 22.9	358 59.0	47.5	267 43.8	52.3	128 43.8	35.3	163 53.7	20.0
N 12	249 25.4	13 58.3	S18 48.3	282 44.6	S14 51.6	143 46.5	N22 35.4	178 56.4	N20 20.0
E 13	264 27.9	28 57.5	49.1	297 45.3	51.0	158 49.2	35.4	193 59.1	20.0
S 14	279 30.3	43 56.8	49.9	312 46.0	50.3	173 51.9	35.4	209 01.8	20.0
15	294 32.8	58 56.0	50.7	327 46.7	49.6	188 54.6	35.5	224 04.5	19.9
16	309 35.3	73 55.3	51.5	342 47.4	49.0	203 57.3	35.5	239 07.1	19.9
17	324 37.7	88 54.5	52.3	357 48.1	48.3	219 00.0	35.5	254 09.8	19.9
18	339 40.2	103 53.8	S18 53.1	12 48.9	S14 47.7	234 02.7	N22 35.5	269 12.5	N20 19.9
19	354 42.7	118 53.0	53.9	27 49.6	47.0	249 05.4	35.6	284 15.2	19.8
20	9 45.1	133 52.3	54.7	42 50.3	46.3	264 08.1	35.6	299 17.9	19.8
21	24 47.6	148 51.5	55.4	57 51.0	45.7	279 10.8	35.6	314 20.5	19.8
22	39 50.0	163 50.8	56.2	72 51.7	45.0	294 13.5	35.7	329 23.2	19.8
23	54 52.5	178 50.0	57.0	87 52.5	44.4	309 16.2	35.7	344 25.9	19.7
1 00	69 55.0	193 49.3	S18 57.8	102 53.2	S14 43.7	324 18.9	N22 35.7	359 28.6	N20 19.7
01	84 57.4	208 48.5	58.6	117 53.9	43.1	339 21.6	35.7	14 31.3	19.7
02	99 59.9	223 47.8	18 59.4	132 54.6	42.4	354 24.3	35.8	29 34.0	19.7
03	115 02.4	238 47.0	19 00.1	147 55.3	41.7	9 27.0	35.8	44 36.6	19.6
04	130 04.8	253 46.3	00.9	162 56.1	41.1	24 29.7	35.8	59 39.3	19.6
05	145 07.3	268 45.5	01.7	177 56.8	40.4	39 32.4	35.9	74 42.0	19.6
06	160 09.8	283 44.7	S19 02.5	192 57.5	S14 39.8	54 35.2	N22 35.9	89 44.7	N20 19.6
07	175 12.2	298 44.0	03.3	207 58.2	39.1	69 37.9	35.9	104 47.4	19.5
S 08	190 14.7	313 43.2	04.0	222 58.9	38.4	84 40.6	35.9	119 50.0	19.5
A 09	205 17.2	328 42.5	04.8	237 59.7	37.8	99 43.3	36.0	134 52.7	19.5
B 10	220 19.6	343 41.7	05.6	253 00.4	37.1	114 46.0	36.0	149 55.4	19.5
A 11	235 22.1	358 40.9	06.4	268 01.1	36.5	129 48.7	36.0	164 58.1	19.4
D 12	250 24.5	13 40.2	S19 07.1	283 01.8	S14 35.8	144 51.4	N22 36.1	180 00.8	N20 19.4
O 13	265 27.0	28 39.4	07.9	298 02.6	35.1	159 54.1	36.1	195 03.4	19.4
14	280 29.5	43 38.7	08.7	313 03.3	34.5	174 56.8	36.1	210 06.1	19.4
15	295 31.9	58 37.9	09.4	328 04.0	33.8	189 59.5	36.2	225 08.8	19.3
16	310 34.4	73 37.1	10.2	343 04.7	33.1	205 02.2	36.2	240 11.5	19.3
17	325 36.9	88 36.4	11.0	358 05.4	32.5	220 04.9	36.2	255 14.2	19.3
18	340 39.3	103 35.6	S19 11.7	13 06.2	S14 31.8	235 07.7	N22 36.2	270 16.8	N20 19.3
19	355 41.8	118 34.8	12.5	28 06.9	31.2	250 10.4	36.3	285 19.5	19.2
20	10 44.3	133 34.1	13.3	43 07.6	30.5	265 13.1	36.3	300 22.2	19.2
21	25 46.7	148 33.3	14.0	58 08.3	29.8	280 15.8	36.3	315 24.9	19.2
22	40 49.2	163 32.5	14.8	73 09.0	29.2	295 18.5	36.4	330 27.6	19.2
23	55 51.7	178 31.8	15.6	88 09.8	28.5	310 21.2	36.4	345 30.3	19.1
2 00	70 54.1	193 31.0	S19 16.3	103 10.5	S14 27.8	325 23.9	N22 36.4	0 32.9	N20 19.1
01	85 56.6	208 30.2	17.1	118 11.2	27.2	340 26.6	36.5	15 35.6	19.1
02	100 59.0	223 29.5	17.8	133 11.9	26.5	355 29.3	36.5	30 38.3	19.1
03	116 01.5	238 28.7	18.6	148 12.7	25.9	10 32.1	36.5	45 41.0	19.1
04	131 04.0	253 27.9	19.4	163 13.4	25.2	25 34.8	36.5	60 43.7	19.0
05	146 06.4	268 27.2	20.1	178 14.1	24.5	40 37.5	36.6	75 46.3	19.0
06	161 08.9	283 26.4	S19 20.9	193 14.8	S14 23.9	55 40.2	N22 36.6	90 49.0	N20 19.0
07	176 11.4	298 25.6	21.6	208 15.6	23.2	70 42.9	36.6	105 51.7	19.0
D 08	191 13.8	313 24.9	22.4	223 16.3	22.5	85 45.6	36.7	120 54.4	18.9
O 09	206 16.3	328 24.1	23.1	238 17.0	21.9	100 48.3	36.7	135 57.1	18.9
M 10	221 18.8	343 23.3	23.9	253 17.7	21.2	115 51.1	36.7	150 59.7	18.9
I 11	236 21.2	358 22.5	24.6	268 18.4	20.5	130 53.8	36.8	166 02.4	18.9
N 12	251 23.7	13 21.8	S19 25.4	283 19.2	S14 19.9	145 56.5	N22 36.8	181 05.1	N20 18.8
G 13	266 26.2	28 21.0	26.1	298 19.9	19.2	160 59.2	36.8	196 07.8	18.8
O 14	281 28.6	43 20.2	26.9	313 20.6	18.5	176 01.9	36.8	211 10.5	18.8
15	296 31.1	58 19.5	27.6	328 21.3	17.9	191 04.6	36.9	226 13.2	18.8
16	311 33.5	73 18.7	28.4	343 22.1	17.2	206 07.3	36.9	241 15.8	18.7
17	326 36.0	88 17.9	29.1	358 22.8	16.5	221 10.1	36.9	256 18.5	18.7
18	341 38.5	103 17.1	S19 29.9	13 23.5	S14 15.9	236 12.8	N22 37.0	271 21.2	N20 18.7
19	356 40.9	118 16.4	30.6	28 24.2	15.2	251 15.5	37.0	286 23.9	18.7
20	11 43.4	133 15.6	31.4	43 25.0	14.5	266 18.2	37.0	301 26.6	18.6
21	26 45.9	148 14.8	32.1	58 25.7	13.9	281 20.9	37.1	316 29.2	18.6
22	41 48.3	163 14.0	32.8	73 26.4	13.2	296 23.7	37.1	331 31.9	18.6
23	56 50.8	178 13.2	33.6	88 27.1	12.5	311 26.4	37.1	346 34.6	18.6
	h m								
Pas. Mer.	19 17.2	v −0.8	d 0.8	v 0.7	d 0.7	v 2.7	d 0.0	v 2.7	d 0.0

ESTRELLAS

Nombre	A.H.S.	Dec.
	° ′	° ′
Acamar	315 24.8	S40 18.0
Achernar	335 33.0	S57 13.9
Acrux	173 20.0	S63 06.2
Adhara	255 19.4	S28 58.3
Aldebaran	290 59.5	N16 30.8
Alioth	166 28.9	N55 56.9
Alkaid	153 06.4	N49 18.2
Al Na'ir	27 55.1	S46 57.4
Alnilam	275 55.3	S 1 12.0
Alphard	218 04.9	S 8 39.8
Alphecca	126 19.1	N26 42.6
Alpheratz	357 52.8	N29 06.1
Altair	62 17.4	N 8 52.4
Ankaa	353 24.4	S42 18.0
Antares	112 37.8	S26 26.1
Arcturus	146 04.3	N19 10.4
Atria	107 48.5	S69 01.8
Avior	234 21.4	S59 30.6
Bellatrix	278 41.4	N 6 21.1
Betelgeuse	271 10.8	N 7 24.5
Canopus	263 59.7	S52 41.7
Capella	280 47.4	N46 00.0
Deneb	49 38.0	N45 17.4
Denebola	182 43.0	N14 33.8
Diphda	349 04.8	S17 58.7
Dubhe	194 02.7	N61 44.3
Elnath	278 23.8	N28 36.5
Eltanin	90 50.9	N51 29.4
Enif	33 56.2	N 9 53.0
Fomalhaut	15 33.9	S29 37.0
Gacrux	172 11.5	S57 07.0
Gienah	176 01.8	S17 32.9
Hadar	149 01.5	S60 22.6
Hamal	328 10.8	N23 28.3
Kaus Aust.	83 56.3	S34 23.1
Kochab	137 20.6	N74 08.8
Markab	13 47.4	N15 13.0
Menkar	314 24.3	N 4 05.8
Menkent	148 18.7	S36 22.5
Miaplacidus	221 41.4	S69 43.1
Mirfak	308 53.0	N49 52.1
Nunki	76 09.9	S26 17.7
Peacock	53 33.8	S56 44.0
Pollux	243 38.6	N28 01.3
Procyon	245 09.0	N 5 13.3
Rasalhague	96 15.2	N12 33.6
Regulus	207 53.1	N11 57.5
Rigel	281 20.5	S 8 11.9
Rigil Kent.	140 05.0	S60 50.3
Sabik	102 23.3	S15 43.6
Schedar	349 50.8	N56 33.0
Shaula	96 34.7	S37 06.3
Sirius	258 41.5	S16 43.0
Spica	158 41.1	S11 10.1
Suhail	222 59.0	S43 26.1
Vega	80 45.5	N38 47.2
Zuben'ubi	137 15.8	S16 02.8

	A.H.S.	Pas. Mer.
	° ′	h m
Venus	123 54.3	11 05
Marte	32 58.2	17 08
Júpiter	254 23.9	2 22
Saturno	289 33.6	0 02

T.U.	SOL				LUNA					
	A.H.G.		Dec.		A.H.G.	v	Dec.	d	P.H.	
d h	°	′	°	′	°	′	′	°	′	′	′
30 00	182	52.0	S21	37.0	13	21.7	10.6	N16	58.9	9.9	56.9
01	197	51.8		37.4	27	51.3	10.6	17	08.8	9.8	56.9
02	212	51.5		37.8	42	20.9	10.4	17	18.6	9.7	57.0
03	227	51.3	. .	38.2	56	50.3	10.4	17	28.3	9.6	57.0
04	242	51.1		38.6	71	19.7	10.2	17	37.9	9.6	57.0
05	257	50.9		39.0	85	48.9	10.2	17	47.5	9.5	57.0
06	272	50.6	S21	39.4	100	18.1	10.1	N17	57.0	9.4	57.1
07	287	50.4		39.8	114	47.2	10.0	18	06.4	9.3	57.1
08	302	50.2		40.2	129	16.2	9.9	18	15.7	9.2	57.1
09	317	50.0	. .	40.6	143	45.1	9.8	18	24.9	9.1	57.1
10	332	49.7		41.0	158	13.9	9.7	18	34.0	9.0	57.2
11	347	49.5		41.4	172	42.6	9.7	18	43.0	9.0	57.2
12	2	49.3	S21	41.8	187	11.3	9.5	N18	52.0	8.8	57.2
13	17	49.0		42.2	201	39.8	9.5	19	00.8	8.8	57.2
14	32	48.8		42.6	216	08.3	9.3	19	09.6	8.6	57.3
15	47	48.6	. .	43.0	230	36.6	9.3	19	18.2	8.6	57.3
16	62	48.4		43.4	245	04.9	9.2	19	26.8	8.4	57.3
17	77	48.1		43.8	259	33.1	9.1	19	35.2	8.4	57.3
18	92	47.9	S21	44.2	274	01.2	9.0	N19	43.6	8.2	57.4
19	107	47.7		44.6	288	29.2	8.9	19	51.8	8.2	57.4
20	122	47.4		45.0	302	57.1	8.8	20	00.0	8.0	57.4
21	137	47.2	. .	45.4	317	24.9	8.8	20	08.0	8.0	57.4
22	152	47.0		45.8	331	52.7	8.6	20	16.0	7.8	57.5
23	167	46.8		46.2	346	20.3	8.6	20	23.8	7.7	57.5
1 00	182	46.5	S21	46.6	0	47.9	8.5	N20	31.5	7.6	57.5
01	197	46.3		47.0	15	15.4	8.3	20	39.1	7.5	57.5
02	212	46.1		47.4	29	42.7	8.3	20	46.6	7.4	57.6
03	227	45.8	. .	47.7	44	10.0	8.3	20	54.0	7.3	57.6
04	242	45.6		48.1	58	37.3	8.1	21	01.3	7.2	57.6
05	257	45.4		48.5	73	04.4	8.0	21	08.5	7.0	57.6
06	272	45.1	S21	48.9	87	31.4	8.0	N21	15.5	6.9	57.7
07	287	44.9		49.3	101	58.4	7.9	21	22.4	6.8	57.7
08	302	44.7		49.7	116	25.3	7.8	21	29.2	6.7	57.7
09	317	44.4	. .	50.1	130	52.1	7.7	21	35.9	6.6	57.7
10	332	44.2		50.5	145	18.8	7.6	21	42.5	6.4	57.8
11	347	44.0		50.8	159	45.4	7.5	21	48.9	6.3	57.8
12	2	43.7	S21	51.2	174	11.9	7.5	N21	55.2	6.2	57.8
13	17	43.5		51.6	188	38.4	7.4	22	01.4	6.1	57.8
14	32	43.3		52.0	203	04.8	7.3	22	07.5	5.9	57.8
15	47	43.0	. .	52.4	217	31.1	7.2	22	13.4	5.8	57.9
16	62	42.8		52.7	231	57.3	7.2	22	19.2	5.7	57.9
17	77	42.6		53.1	246	23.5	7.1	22	24.9	5.6	57.9
18	92	42.3	S21	53.5	260	49.6	7.0	N22	30.5	5.4	57.9
19	107	42.1		53.9	275	15.6	6.9	22	35.9	5.3	58.0
20	122	41.9		54.3	289	41.5	6.9	22	41.2	5.1	58.0
21	137	41.6	. .	54.6	304	07.4	6.8	22	46.3	5.0	58.0
22	152	41.4		55.0	318	33.2	6.7	22	51.3	4.9	58.0
23	167	41.1		55.4	332	58.9	6.6	22	56.2	4.7	58.0
2 00	182	40.9	S21	55.8	347	24.5	6.6	N23	00.9	4.6	58.1
01	197	40.7		56.1	1	50.1	6.5	23	05.5	4.5	58.1
02	212	40.4		56.5	16	15.6	6.5	23	10.0	4.3	58.1
03	227	40.2	. .	56.9	30	41.1	6.4	23	14.3	4.2	58.1
04	242	40.0		57.3	45	06.5	6.3	23	18.5	4.0	58.1
05	257	39.7		57.6	59	31.8	6.3	23	22.5	3.9	58.2
06	272	39.5	S21	58.0	73	57.1	6.2	N23	26.4	3.7	58.2
07	287	39.2		58.4	88	22.3	6.1	23	30.1	3.6	58.2
08	302	39.0		58.7	102	47.4	6.1	23	33.7	3.5	58.2
09	317	38.8	. .	59.1	117	12.5	6.0	23	37.2	3.3	58.2
10	332	38.5		59.5	131	37.5	6.0	23	40.5	3.2	58.3
11	347	38.3	21	59.8	146	02.5	5.9	23	43.7	3.0	58.3
12	2	38.0	S22	00.2	160	27.4	5.9	N23	46.7	2.8	58.3
13	17	37.8		00.6	174	52.3	5.9	23	49.5	2.7	58.3
14	32	37.6		00.9	189	17.2	5.7	23	52.2	2.6	58.3
15	47	37.3	. .	01.3	203	41.9	5.8	23	54.8	2.4	58.4
16	62	37.1		01.6	218	06.7	5.7	23	57.2	2.3	58.4
17	77	36.8		02.0	232	31.4	5.6	23	59.5	2.1	58.4
18	92	36.6	S22	02.4	246	56.0	5.6	N24	01.6	1.9	58.4
19	107	36.4		02.7	261	20.6	5.6	24	03.5	1.8	58.4
20	122	36.1		03.1	275	45.2	5.5	24	05.3	1.6	58.4
21	137	35.9	. .	03.5	290	09.7	5.5	24	06.9	1.5	58.5
22	152	35.6		03.8	304	34.2	5.5	24	08.4	1.3	58.5
23	167	35.4		04.2	318	58.7	5.4	N24	09.7	1.2	58.5
	SD	16.2	*d*	0.4	SD		15.6		15.7		15.9

VIERNES — SABADO — DOMINGO

Lat.	Crepúsculo Náutico	Crepúsculo Civil	Orto Sol	Orto Luna 30	Orto Luna 1	Orto Luna 2	Orto Luna 3
°	h m	h m	h m	h m	h m	h m	h m
N 72	07 51	09 50	▬	▭	▭	▭	▭
N 70	07 35	09 11	▬	12 54	▭	▭	▭
68	07 22	08 44	10 37	13 41	12 51	▭	▭
66	07 11	08 23	09 47	14 12	14 07	13 59	▭
64	07 01	08 06	09 16	14 36	14 45	15 07	16 01
62	06 53	07 53	08 53	14 54	15 11	15 43	16 39
60	06 46	07 41	08 35	15 10	15 32	16 09	17 06
N 58	06 39	07 30	08 20	15 23	15 49	16 29	17 27
56	06 34	07 21	08 07	15 34	16 04	16 46	17 44
54	06 28	07 13	07 56	15 44	16 16	17 00	17 59
52	06 23	07 06	07 46	15 53	16 27	17 13	18 12
50	06 19	06 59	07 37	16 01	16 37	17 24	18 23
45	06 08	06 45	07 18	16 18	16 58	17 47	18 46
N 40	05 59	06 33	07 03	16 32	17 15	18 05	19 05
35	05 51	06 22	06 50	16 44	17 29	18 21	19 21
30	05 43	06 12	06 38	16 55	17 41	18 35	19 34
20	05 28	05 55	06 19	17 13	18 03	18 58	19 57
N 10	05 13	05 39	06 02	17 29	18 21	19 18	20 17
0	04 57	05 23	05 45	17 44	18 39	19 37	20 36
S 10	04 40	05 06	05 29	17 59	18 56	19 56	20 55
20	04 19	04 47	05 12	18 15	19 15	20 16	21 15
30	03 52	04 24	04 51	18 34	19 37	20 39	21 38
35	03 35	04 10	04 39	18 45	19 50	20 53	21 52
40	03 13	03 54	04 26	18 57	20 04	21 09	22 08
45	02 46	03 33	04 09	19 12	20 22	21 28	22 26
S 50	02 07	03 06	03 49	19 31	20 44	21 52	22 50
52	01 45	02 53	03 39	19 39	20 54	22 03	23 01
54	01 15	02 37	03 28	19 49	21 06	22 16	23 13
56	00 17	02 19	03 15	20 00	21 20	22 31	23 28
58	////	01 55	03 01	20 13	21 36	22 49	23 45
S 60	////	01 23	02 43	20 28	21 55	23 11	24 06

Lat.	Ocaso Sol	Crepúsculo Civil	Crepúsculo Náutico	Ocaso Luna 30	Ocaso Luna 1	Ocaso Luna 2	Ocaso Luna 3
°	h m	h m	h m	h m	h m	h m	h m
N 72	▬	13 47	15 46	▭	▭	▭	▭
N 70	▬	14 26	16 03	09 52	▭	▭	▭
68	13 01	14 54	16 16	09 05	11 47	▭	▭
66	13 51	15 14	16 27	08 35	10 32	12 39	▭
64	14 21	15 31	16 36	08 12	09 55	11 32	12 42
62	14 44	15 45	16 45	07 55	09 29	10 56	12 04
60	15 03	15 57	16 52	07 40	09 09	10 31	11 37
N 58	15 18	16 07	16 58	07 27	08 52	10 11	11 16
56	15 31	16 16	17 04	07 17	08 38	09 54	10 58
54	15 42	16 24	17 10	07 07	08 26	09 40	10 44
52	15 52	16 32	17 15	06 59	08 15	09 27	10 31
50	16 01	16 38	17 19	06 51	08 06	09 16	10 20
45	16 20	16 53	17 30	06 35	07 46	08 54	09 56
N 40	16 35	17 05	17 39	06 22	07 29	08 35	09 37
35	16 48	17 16	17 47	06 11	07 16	08 20	09 21
30	17 00	17 26	17 55	06 01	07 04	08 07	09 08
20	17 19	17 43	18 10	05 45	06 44	07 44	08 44
N 10	17 37	17 59	18 25	05 30	06 26	07 24	08 24
0	17 53	18 15	18 41	05 17	06 10	07 06	08 05
S 10	18 09	18 32	18 59	05 03	05 53	06 48	07 46
20	18 27	18 51	19 20	04 49	05 36	06 28	07 26
30	18 47	19 14	19 47	04 33	05 16	06 06	07 02
35	18 59	19 28	20 04	04 23	05 04	05 52	06 48
40	19 13	19 45	20 25	04 12	04 51	05 37	06 32
45	19 30	20 06	20 53	04 00	04 35	05 19	06 13
S 50	19 50	20 33	21 33	03 44	04 16	04 57	05 49
52	20 00	20 46	21 55	03 37	04 07	04 46	05 38
54	20 11	21 02	22 26	03 29	03 57	04 34	05 25
56	20 24	21 21	23 33	03 21	03 45	04 20	05 10
58	20 38	21 45	////	03 11	03 32	04 04	04 52
S 60	20 56	22 18	////	02 59	03 16	03 44	04 30

Día	SOL E.T. (+) 00h m s	SOL E.T. (+) 12h m s	SOL Pas. Mer. h m	LUNA Pas. Sup. h m	LUNA Mer. Inf. h m	LUNA Edad d	LUNA Fase %
d	m s	m s	h m	h m	h m	d	%
30	11 28	11 18	11 49	23 57	11 30	15	100
1	11 07	10 55	11 49	24 52	12 24	16	100
2	10 44	10 33	11 49	00 52	13 21	17	97

T.U.	ARIES	VENUS −3.9		MARTE +0.5		JUPITER −2.7		SATURNO −0.4		ESTRELLAS		
	A.H.G.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.	Nombre	A.H.S.	Dec.
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′		° ′	° ′
9 00	77 48.1	191 15.1	S21 10.4	105 13.4	S12 33.6	333 03.5	N22 41.7	8 03.3	N20 15.1	Acamar	315 24.8	S40 18.0
01	92 50.6	206 14.2	11.0	120 14.1	32.9	348 06.3	41.8	23 06.0	15.1	Achernar	335 33.0	S57 13.9
02	107 53.0	221 13.4	11.5	135 14.8	32.2	3 09.0	41.8	38 08.7	15.0	Acrux	173 19.9	S63 06.2
03	122 55.5	236 12.5 . .	12.1	150 15.6 . .	31.5	18 11.8 . .	41.8	53 11.4 . .	15.0	Adhara	255 19.3	S28 58.4
04	137 58.0	251 11.7	12.7	165 16.3	30.8	33 14.5	41.9	68 14.1	15.0	Aldebaran	290 59.5	N16 30.8
05	153 00.4	266 10.8	13.3	180 17.1	30.1	48 17.3	41.9	83 16.7	15.0			
06	168 02.9	281 10.0	S21 13.9	195 17.8	S12 29.4	63 20.1	N22 41.9	98 19.4	N20 14.9	Alioth	166 28.8	N55 56.8
07	183 05.3	296 09.1	14.5	210 18.5	28.8	78 22.8	42.0	113 22.1	14.9	Alkaid	153 06.3	N49 18.1
D 08	198 07.8	311 08.3	15.1	225 19.3	28.1	93 25.6	42.0	128 24.8	14.9	Al Na'ir	27 55.2	S46 57.4
O 09	213 10.3	326 07.4 . .	15.7	240 20.0 . .	27.4	108 28.3 . .	42.0	143 27.5 . .	14.9	Alnilam	275 55.2	S 1 12.0
M 10	228 12.7	341 06.6	16.2	255 20.8	26.7	123 31.1	42.1	158 30.1	14.8	Alphard	218 04.9	S 8 39.9
I 11	243 15.2	356 05.7	16.8	270 21.5	26.0	138 33.9	42.1	173 32.8	14.8			
N 12	258 17.7	11 04.9	S21 17.4	285 22.2	S12 25.3	153 36.6	N22 42.1	188 35.5	N20 14.8	Alphecca	126 19.0	N26 42.5
G 13	273 20.1	26 04.0	18.0	300 23.0	24.6	168 39.4	42.2	203 38.2	14.8	Alpheratz	357 52.9	N29 06.1
O 14	288 22.6	41 03.1	18.6	315 23.7	23.9	183 42.2	42.2	218 40.9	14.8	Altair	62 17.4	N 8 52.4
15	303 25.1	56 02.3 . .	19.1	330 24.5 . .	23.2	198 44.9 . .	42.2	233 43.5 . .	14.7	Ankaa	353 24.4	S42 18.1
16	318 27.5	71 01.4	19.7	345 25.2	22.5	213 47.7	42.3	248 46.2	14.7	Antares	112 37.8	S26 26.1
17	333 30.0	86 00.6	20.3	0 26.0	21.8	228 50.4	42.3	263 48.9	14.7			
18	348 32.4	100 59.7	S21 20.9	15 26.7	S12 21.1	243 53.2	N22 42.4	278 51.6	N20 14.7	Arcturus	146 04.3	N19 10.4
19	3 34.9	115 58.9	21.4	30 27.4	20.4	258 56.0	42.4	293 54.2	14.6	Atria	107 48.5	S69 01.8
20	18 37.4	130 58.0	22.0	45 28.2	19.7	273 58.7	42.4	308 56.9	14.6	Avior	234 21.3	S59 30.7
21	33 39.8	145 57.1 . .	22.6	60 28.9 . .	19.0	289 01.5 . .	42.5	323 59.6 . .	14.6	Bellatrix	278 41.4	N 6 21.1
22	48 42.3	160 56.3	23.1	75 29.7	18.3	304 04.3	42.5	339 02.3	14.6	Betelgeuse	271 10.8	N 7 24.5
23	63 44.8	175 55.4	23.7	90 30.4	17.6	319 07.0	42.5	354 05.0	14.5			
10 00	78 47.2	190 54.6	S21 24.3	105 31.1	S12 16.9	334 09.8	N22 42.6	9 07.6	N20 14.5	Canopus	263 59.6	S52 41.7
01	93 49.7	205 53.7	24.9	120 31.9	16.2	349 12.5	42.6	24 10.3	14.5	Capella	280 47.4	N46 00.0
02	108 52.2	220 52.8	25.4	135 32.6	15.5	4 15.3	42.6	39 13.0	14.5	Deneb	49 38.0	N45 17.4
03	123 54.6	235 52.0 . .	26.0	150 33.4 . .	14.8	19 18.1 . .	42.7	54 15.7 . .	14.4	Denebola	182 42.9	N14 33.7
04	138 57.1	250 51.1	26.5	165 34.1	14.1	34 20.8	42.7	69 18.4	14.4	Diphda	349 04.8	S17 58.7
05	153 59.6	265 50.3	27.1	180 34.9	13.4	49 23.6	42.7	84 21.0	14.4			
06	169 02.0	280 49.4	S21 27.7	195 35.6	S12 12.7	64 26.4	N22 42.8	99 23.7	N20 14.4	Dubhe	194 02.6	N61 44.2
07	184 04.5	295 48.5	28.2	210 36.3	12.0	79 29.1	42.8	114 26.4	14.4	Elnath	278 23.7	N28 36.5
L 08	199 06.9	310 47.7	28.8	225 37.1	11.3	94 31.9	42.8	129 29.1	14.3	Eltanin	90 50.9	N51 29.4
U 09	214 09.4	325 46.8 . .	29.3	240 37.8 . .	10.6	109 34.7 . .	42.9	144 31.8 . .	14.3	Enif	33 56.2	N 9 53.0
N 10	229 11.9	340 45.9	29.9	255 38.6	09.9	124 37.4	42.9	159 34.4	14.3	Fomalhaut	15 34.0	S29 37.0
E 11	244 14.3	355 45.1	30.5	270 39.3	09.2	139 40.2	42.9	174 37.1	14.3			
S 12	259 16.8	10 44.2	S21 31.0	285 40.1	S12 08.5	154 43.0	N22 43.0	189 39.8	N20 14.2	Gacrux	172 11.4	S57 07.0
13	274 19.3	25 43.3	31.6	300 40.8	07.8	169 45.7	43.0	204 42.5	14.2	Gienah	176 01.8	S17 32.9
14	289 21.7	40 42.5	32.1	315 41.6	07.1	184 48.5	43.0	219 45.1	14.2	Hadar	149 01.4	S60 22.6
15	304 24.2	55 41.6 . .	32.7	330 42.3 . .	06.4	199 51.3 . .	43.1	234 47.8 . .	14.2	Hamal	328 10.8	N23 28.3
16	319 26.7	70 40.7	33.2	345 43.0	05.7	214 54.0	43.1	249 50.5	14.1	Kaus Aust.	83 56.2	S34 23.1
17	334 29.1	85 39.9	33.8	0 43.8	05.0	229 56.8	43.1	264 53.2	14.1			
18	349 31.6	100 39.0	S21 34.3	15 44.5	S12 04.3	244 59.6	N22 43.2	279 55.9	N20 14.1	Kochab	137 20.5	N74 08.7
19	4 34.1	115 38.1	34.9	30 45.3	03.6	260 02.3	43.2	294 58.5	14.1	Markab	13 47.4	N15 12.9
20	19 36.5	130 37.3	35.4	45 46.0	02.9	275 05.1	43.2	310 01.2	14.0	Menkar	314 24.3	N 4 05.8
21	34 39.0	145 36.4 . .	36.0	60 46.8 . .	02.2	290 07.9 . .	43.3	325 03.9 . .	14.0	Menkent	148 18.6	S36 22.5
22	49 41.4	160 35.5	36.5	75 47.5	01.5	305 10.6	43.3	340 06.6	14.0	Miaplacidus	221 41.2	S69 43.1
23	64 43.9	175 34.7	37.0	90 48.2	00.8	320 13.4	43.3	355 09.3	14.0			
11 00	79 46.4	190 33.8	S21 37.6	105 49.0	S12 00.1	335 16.2	N22 43.4	10 11.9	N20 14.0	Mirfak	308 53.0	N49 52.1
01	94 48.8	205 32.9	38.1	120 49.7	11 59.4	350 18.9	43.4	25 14.6	13.9	Nunki	76 09.9	S26 17.7
02	109 51.3	220 32.0	38.7	135 50.5	58.7	5 21.7	43.4	40 17.3	13.9	Peacock	53 33.8	S56 44.0
03	124 53.8	235 31.2 . .	39.2	150 51.2 . .	58.0	20 24.5 . .	43.5	55 20.0 . .	13.9	Pollux	243 38.5	N28 01.3
04	139 56.2	250 30.3	39.7	165 52.0	57.2	35 27.3	43.5	70 22.6	13.9	Procyon	245 08.9	N 5 13.3
05	154 58.7	265 29.4	40.3	180 52.7	56.5	50 30.0	43.5	85 25.3	13.8			
06	170 01.2	280 28.6	S21 40.8	195 53.5	S11 55.8	65 32.8	N22 43.6	100 28.0	N20 13.8	Rasalhague	96 15.2	N12 33.6
07	185 03.6	295 27.7	41.3	210 54.2	55.1	80 35.6	43.6	115 30.7	13.8	Regulus	207 53.0	N11 57.5
M 08	200 06.1	310 26.8	41.9	225 55.0	54.4	95 38.3	43.6	130 33.4	13.8	Rigel	281 20.4	S 8 12.0
09	215 08.5	325 25.9 . .	42.4	240 55.7 . .	53.7	110 41.1 . .	43.7	145 36.0 . .	13.7	Rigil Kent.	140 04.9	S60 50.3
A 10	230 11.0	340 25.1	42.9	255 56.4	53.0	125 43.9	43.7	160 38.7	13.7	Sabik	102 23.3	S15 43.6
R 11	245 13.5	355 24.2	43.5	270 57.2	52.3	140 46.7	43.7	175 41.4	13.7			
T 12	260 15.9	10 23.3	S21 44.0	285 57.9	S11 51.6	155 49.4	N22 43.8	190 44.1	N20 13.7	Schedar	349 50.8	N56 33.0
13	275 18.4	25 22.4	44.5	300 58.7	50.9	170 52.2	43.8	205 46.7	13.7	Shaula	96 34.7	S37 06.3
E 14	290 20.9	40 21.6	45.0	315 59.4	50.2	185 55.0	43.8	220 49.4	13.6	Sirius	258 41.4	S16 43.0
15	305 23.3	55 20.7 . .	45.6	331 00.2 .	49.5	200 57.7 . .	43.9	235 52.1 . .	13.6	Spica	158 41.0	S11 10.1
S 16	320 25.8	70 19.8	46.1	346 00.9	48.8	216 00.5	43.9	250 54.8	13.6	Suhail	222 58.9	S43 26.1
17	335 28.3	85 18.9	46.6	1 01.7	48.1	231 03.3	43.9	265 57.5	13.6			
18	350 30.7	100 18.0	S21 47.1	16 02.4	S11 47.4	246 06.1	N22 44.0	281 00.1	N20 13.5	Vega	80 45.5	N38 47.2
19	5 33.2	115 17.2	47.7	31 03.2	46.7	261 08.8	44.0	296 02.8	13.5	Zuben'ubi	137 15.8	S16 02.8
20	20 35.7	130 16.3	48.2	46 03.9	46.0	276 11.6	44.0	311 05.5	13.5		A.H.S.	Pas. Mer.
21	35 38.1	145 15.4 . .	48.7	61 04.7 .	45.3	291 14.4 . .	44.1	326 08.2 . .	13.5		° ′	h m
22	50 40.6	160 14.5	49.2	76 05.4	44.6	306 17.2	44.1	341 10.8	13.4	Venus	112 07.3	11 17
23	65 43.0	175 13.6	49.7	91 06.1	43.8	321 19.9	44.1	356 13.5	13.4	Marte	26 43.9	16 57
	h m									Júpiter	255 22.5	1 43
Pas. Mer.	18 41.8	v −0.9	d 0.6	v 0.7	d 0.7	v 2.8	d 0.0	v 2.7	d 0.0	Saturno	290 20.4	23 19

T.U.	SOL A.H.G.	SOL Dec.	LUNA A.H.G.	LUNA v	LUNA Dec.	LUNA d	LUNA P.H.
d h	° ′	° ′	° ′	′	° ′	′	′
9 00	181 57.4	S22 48.0	253 31.1	11.2	N 3 52.2	14.3	59.1
01	196 57.2	48.3	268 01.3	11.3	3 37.9	14.3	59.1
02	211 56.9	48.5	282 31.6	11.2	3 23.6	14.3	59.1
03	226 56.6	48.8	297 01.8	11.3	3 09.3	14.4	59.1
04	241 56.3	49.0	311 32.1	11.4	2 54.9	14.3	59.1
05	256 56.1	49.3	326 02.5	11.3	2 40.6	14.4	59.1
06	271 55.8	S22 49.5	340 32.8	11.3	N 2 26.2	14.4	59.0
07	286 55.5	49.7	355 03.1	11.4	2 11.8	14.4	59.0
D 08	301 55.2	50.0	9 33.5	11.4	1 57.4	14.4	59.0
O 09	316 54.9	50.2	24 03.9	11.4	1 43.0	14.4	59.0
M 10	331 54.7	50.5	38 34.3	11.4	1 28.6	14.4	59.0
I 11	346 54.4	50.7	53 04.7	11.4	1 14.2	14.4	59.0
N 12	1 54.1	S22 50.9	67 35.1	11.5	N 0 59.8	14.4	59.0
G 13	16 53.8	51.2	82 05.6	11.4	0 45.4	14.4	59.0
O 14	31 53.5	51.4	96 36.0	11.4	0 31.0	14.4	59.0
15	46 53.3	51.7	111 06.4	11.5	0 16.6	14.4	59.0
16	61 53.0	51.9	125 36.9	11.5	N 0 02.2	14.4	59.0
17	76 52.7	52.1	140 07.4	11.5	S 0 12.2	14.4	59.0
18	91 52.4	S22 52.4	154 37.9	11.4	S 0 26.6	14.4	59.0
19	106 52.1	52.6	169 08.3	11.5	0 41.0	14.4	58.9
20	121 51.8	52.8	183 38.8	11.5	0 55.4	14.4	58.9
21	136 51.6	53.1	198 09.3	11.5	1 09.8	14.4	58.9
22	151 51.3	53.3	212 39.8	11.5	1 24.2	14.4	58.9
23	166 51.0	53.5	227 10.3	11.5	1 38.6	14.3	58.9
10 00	181 50.7	S22 53.7	241 40.8	11.5	S 1 52.9	14.3	58.9
01	196 50.4	54.0	256 11.3	11.4	2 07.2	14.4	58.9
02	211 50.1	54.2	270 41.7	11.5	2 21.6	14.3	58.9
03	226 49.9	54.4	285 12.2	11.5	2 35.9	14.3	58.9
04	241 49.6	54.7	299 42.7	11.5	2 50.2	14.2	58.9
05	256 49.3	54.9	314 13.2	11.5	3 04.4	14.3	58.9
06	271 49.0	S22 55.1	328 43.7	11.4	S 3 18.7	14.2	58.8
07	286 48.7	55.3	343 14.1	11.5	3 32.9	14.2	58.8
L 08	301 48.4	55.5	357 44.6	11.4	3 47.1	14.2	58.8
09	316 48.2	55.8	12 15.0	11.5	4 01.3	14.2	58.8
U 10	331 47.9	56.0	26 45.5	11.4	4 15.5	14.1	58.8
N 11	346 47.6	56.2	41 15.9	11.4	4 29.6	14.1	58.8
12	1 47.3	S22 56.4	55 46.3	11.4	S 4 43.7	14.1	58.8
E 13	16 47.0	56.6	70 16.7	11.4	4 57.8	14.0	58.8
14	31 46.7	56.9	84 47.1	11.4	5 11.8	14.1	58.8
S 15	46 46.4	57.1	99 17.5	11.3	5 25.9	14.0	58.8
16	61 46.2	57.3	113 47.8	11.4	5 39.9	13.9	58.7
17	76 45.9	57.5	128 18.2	11.3	5 53.8	13.9	58.7
18	91 45.6	S22 57.7	142 48.5	11.3	S 6 07.7	13.9	58.7
19	106 45.3	57.9	157 18.8	11.3	6 21.6	13.8	58.7
20	121 45.0	58.2	171 49.1	11.3	6 35.4	13.8	58.7
21	136 44.7	58.4	186 19.4	11.3	6 49.2	13.8	58.7
22	151 44.4	58.6	200 49.7	11.2	7 03.0	13.7	58.7
23	166 44.2	58.8	215 19.9	11.2	7 16.7	13.7	58.7
11 00	181 43.9	S22 59.0	229 50.1	11.2	S 7 30.4	13.6	58.6
01	196 43.6	59.2	244 20.3	11.2	7 44.0	13.6	58.6
02	211 43.3	59.4	258 50.5	11.1	7 57.6	13.6	58.6
03	226 43.0	59.6	273 20.6	11.1	8 11.2	13.5	58.6
04	241 42.7	22 59.8	287 50.7	11.1	8 24.7	13.4	58.6
05	256 42.4	23 00.0	302 20.8	11.1	8 38.1	13.4	58.6
06	271 42.1	S23 00.2	316 50.9	11.0	S 8 51.5	13.4	58.6
07	286 41.9	00.4	331 20.9	11.0	9 04.9	13.3	58.6
M 08	301 41.6	00.7	345 50.9	11.0	9 18.2	13.2	58.5
A 09	316 41.3	00.9	0 20.9	10.9	9 31.4	13.2	58.5
R 10	331 41.0	01.1	14 50.8	11.0	9 44.6	13.1	58.5
T 11	346 40.7	01.3	29 20.8	10.9	9 57.7	13.1	58.5
E 12	1 40.4	S23 01.5	43 50.7	10.8	S10 10.8	13.0	58.5
13	16 40.1	01.7	58 20.5	10.8	10 23.8	12.9	58.5
S 14	31 39.8	01.9	72 50.3	10.8	10 36.7	12.9	58.5
15	46 39.5	02.1	87 20.1	10.8	10 49.6	12.8	58.4
16	61 39.3	02.3	101 49.9	10.7	11 02.4	12.8	58.4
17	76 39.0	02.4	116 19.6	10.7	11 15.2	12.7	58.4
18	91 38.7	S23 02.6	130 49.3	10.7	S11 27.9	12.6	58.4
19	106 38.4	02.8	145 19.0	10.6	11 40.5	12.6	58.4
20	121 38.1	03.0	159 48.6	10.6	11 53.1	12.5	58.4
21	136 37.8	03.2	174 18.2	10.6	12 05.6	12.4	58.3
22	151 37.5	03.4	188 47.8	10.5	12 18.0	12.4	58.3
23	166 37.2	03.6	203 17.3	10.5	S12 30.4	12.2	58.3
	SD 16.3	d 0.2	SD 16.1		16.0		15.9

Lat.	Crepúsculo Náutico	Crepúsculo Civil	Orto Sol	Orto Luna 9	Orto Luna 10	Orto Luna 11	Orto Luna 12
°	h m	h m	h m	h m	h m	h m	h m
N 72	08 12	10 30	▬	00 22	02 31	04 43	07 10
N 70	07 53	09 37	▬	00 27	02 27	04 29	06 38
68	07 38	09 05	▬	00 31	02 24	04 17	06 16
66	07 26	08 41	10 16	00 35	02 21	04 08	05 58
64	07 15	08 23	09 38	00 38	02 19	04 01	05 44
62	07 06	08 07	09 11	00 41	02 17	03 54	05 32
60	06 58	07 54	08 51	00 43	02 16	03 48	05 22
N 58	06 51	07 43	08 34	00 45	02 14	03 44	05 13
56	06 44	07 33	08 20	00 47	02 13	03 39	05 05
54	06 38	07 24	08 08	00 48	02 12	03 35	04 59
52	06 33	07 16	07 57	00 50	02 11	03 32	04 52
50	06 28	07 09	07 47	00 51	02 10	03 29	04 47
45	06 17	06 54	07 27	00 54	02 08	03 22	04 35
N 40	06 07	06 40	07 11	00 56	02 06	03 16	04 26
35	05 57	06 29	06 57	00 58	02 05	03 11	04 17
30	05 49	06 19	06 45	01 00	02 03	03 07	04 10
20	05 33	06 00	06 24	01 03	02 01	02 59	03 58
N 10	05 17	05 43	06 06	01 06	01 59	02 53	03 47
0	05 01	05 27	05 49	01 09	01 58	02 47	03 37
S 10	04 42	05 09	05 32	01 11	01 56	02 41	03 27
20	04 20	04 49	05 13	01 14	01 54	02 35	03 16
30	03 51	04 25	04 52	01 17	01 52	02 27	03 04
35	03 33	04 10	04 39	01 19	01 51	02 23	02 57
40	03 11	03 52	04 25	01 21	01 50	02 19	02 50
45	02 41	03 30	04 07	01 24	01 48	02 14	02 41
S 50	01 58	03 01	03 45	01 27	01 47	02 07	02 30
52	01 32	02 47	03 35	01 28	01 46	02 04	02 25
54	00 53	02 30	03 23	01 29	01 45	02 01	02 19
56	////	02 09	03 09	01 31	01 44	01 58	02 13
58	////	01 41	02 53	01 33	01 43	01 54	02 07
S 60	////	00 59	02 34	01 35	01 42	01 50	01 59

Lat.	Ocaso Sol	Crepúsculo Civil	Crepúsculo Náutico	Ocaso Luna 9	Ocaso Luna 10	Ocaso Luna 11	Ocaso Luna 12
°	h m	h m	h m	h m	h m	h m	h m
N 72	▬	13 16	15 33	13 38	13 15	12 47	12 06
N 70	▬	14 08	15 52	13 38	13 22	13 04	12 39
68	▬	14 40	16 07	13 37	13 27	13 17	13 04
66	13 30	15 04	16 20	13 37	13 32	13 28	13 23
64	14 08	15 23	16 30	13 36	13 37	13 37	13 38
62	14 34	15 38	16 39	13 36	13 40	13 45	13 51
60	14 55	15 51	16 47	13 36	13 43	13 52	14 02
N 58	15 11	16 02	16 55	13 36	13 46	13 58	14 12
56	15 26	16 12	17 01	13 35	13 49	14 03	14 20
54	15 38	16 21	17 07	13 35	13 51	14 08	14 28
52	15 49	16 29	17 13	13 35	13 53	14 12	14 34
50	15 58	16 36	17 18	13 35	13 55	14 16	14 41
45	16 18	16 52	17 29	13 34	13 59	14 25	14 54
N 40	16 35	17 05	17 39	13 34	14 03	14 32	15 05
35	16 49	17 17	17 48	13 34	14 06	14 39	15 14
30	17 01	17 27	17 57	13 33	14 08	14 44	15 22
20	17 21	17 45	18 13	13 33	14 13	14 54	15 37
N 10	17 39	18 02	18 29	13 33	14 17	15 02	15 49
0	17 57	18 19	18 45	13 32	14 21	15 10	16 01
S 10	18 14	18 37	19 04	13 32	14 25	15 13	16 13
20	18 32	18 57	19 26	13 31	14 29	15 27	16 26
30	18 54	19 21	19 54	13 30	14 34	15 37	16 40
35	19 07	19 36	20 13	13 30	14 36	15 43	16 49
40	19 21	19 54	20 35	13 30	14 39	15 49	16 59
45	19 39	20 16	21 05	13 29	14 43	15 57	17 10
S 50	20 01	20 45	21 49	13 29	14 47	16 06	17 24
52	20 11	21 00	22 15	13 28	14 49	16 10	17 31
54	20 23	21 17	22 55	13 28	14 51	16 15	17 38
56	20 37	21 38	////	13 28	14 54	16 20	17 46
58	20 53	22 06	////	13 27	14 57	16 26	17 55
S 60	21 13	22 49	////	13 27	15 00	16 32	18 06

Día	SOL E.T. (+) 00h	SOL E.T. (+) 12h	SOL Pas. Mer.	LUNA Pas. Sup.	LUNA Mer. Inf.	LUNA Edad	LUNA Fase
d	m s	m s	h m	h m	h m	d	%
9	07 50	07 37	11 52	07 20	19 45	24	31
10	07 23	07 10	11 53	08 09	20 34	25	21
11	06 56	06 42	11 53	08 59	21 24	26	13

(MIE., JUE., VIE.) 12, 13, 14 DICIEMBRE DEL 2001

T.U.	ARIES	VENUS −3.9		MARTE +0.6		JUPITER −2.7		SATURNO −0.4	
	A.H.G.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
12 00	80 45.5	190 12.8	S21 50.2	106 06.9	S11 43.1	336 22.7	N22 44.2	11 16.2	N20 13.4
01	95 48.0	205 11.9	50.8	121 07.6	42.4	351 25.5	44.2	26 18.9	13.4
02	110 50.4	220 11.0	51.3	136 08.4	41.7	6 28.3	44.2	41 21.5	13.3
03	125 52.9	235 10.1 . .	51.8	151 09.1 . .	41.0	21 31.0 . .	44.3	56 24.2 . .	13.3
04	140 55.4	250 09.2	52.3	166 09.9	40.3	36 33.8	44.3	71 26.9	13.3
05	155 57.8	265 08.4	52.8	181 10.6	39.6	51 36.6	44.3	86 29.6	13.3
06	171 00.3	280 07.5	S21 53.3	196 11.4	S11 38.9	66 39.4	N22 44.4	101 32.3	N20 13.3
M 07	186 02.8	295 06.6	53.8	211 12.1	38.2	81 42.1	44.4	116 34.9	13.2
I 08	201 05.2	310 05.7	54.3	226 12.9	37.5	96 44.9	44.4	131 37.6	13.2
E 09	216 07.7	325 04.8 . .	54.8	241 13.6 . .	36.8	111 47.7 . .	44.5	146 40.3 . .	13.2
R 10	231 10.2	340 03.9	55.3	256 14.4	36.1	126 50.5	44.5	161 43.0	13.2
C 11	246 12.6	355 03.1	55.8	271 15.1	35.4	141 53.3	44.6	176 45.6	13.1
O 12	261 15.1	10 02.2	S21 56.3	286 15.9	S11 34.6	156 56.0	N22 44.6	191 48.3	N20 13.1
L 13	276 17.5	25 01.3	56.8	301 16.6	33.9	171 58.8	44.6	206 51.0	13.1
E 14	291 20.0	40 00.4	57.3	316 17.4	33.2	187 01.6	44.7	221 53.7	13.1
S 15	306 22.5	54 59.5 . .	57.8	331 18.1 . .	32.5	202 04.4 . .	44.7	236 56.3 . .	13.0
16	321 24.9	69 58.6	58.3	346 18.9	31.8	217 07.1	44.7	251 59.0	13.0
17	336 27.4	84 57.7	58.8	1 19.6	31.1	232 09.9	44.8	267 01.7	13.0
18	351 29.9	99 56.8	S21 59.3	16 20.4	S11 30.4	247 12.7	N22 44.8	282 04.4	N20 13.0
19	6 32.3	114 56.0	21 59.8	31 21.1	29.7	262 15.5	44.8	297 07.1	13.0
20	21 34.8	129 55.1	22 00.3	46 21.8	29.0	277 18.3	44.9	312 09.7	12.9
21	36 37.3	144 54.2 . .	00.8	61 22.6 . .	28.3	292 21.0 . .	44.9	327 12.4 . .	12.9
22	51 39.7	159 53.3	01.3	76 23.3	27.5	307 23.8	44.9	342 15.1	12.9
23	66 42.2	174 52.4	01.8	91 24.1	26.8	322 26.6	45.0	357 17.8	12.9
13 00	81 44.7	189 51.5	S22 02.3	106 24.8	S11 26.1	337 29.4	N22 45.0	12 20.4	N20 12.8
01	96 47.1	204 50.6	02.8	121 25.6	25.4	352 32.2	45.0	27 23.1	12.8
02	111 49.6	219 49.7	03.2	136 26.3	24.7	7 34.9	45.1	42 25.8	12.8
03	126 52.0	234 48.8 . .	03.7	151 27.1 . .	24.0	22 37.7 . .	45.1	57 28.5 . .	12.8
04	141 54.5	249 47.9	04.2	166 27.8	23.3	37 40.5	45.1	72 31.1	12.7
05	156 57.0	264 47.0	04.7	181 28.6	22.6	52 43.3	45.2	87 33.8	12.7
06	171 59.4	279 46.2	S22 05.2	196 29.3	S11 21.9	67 46.1	N22 45.2	102 36.5	N20 12.7
07	187 01.9	294 45.3	05.6	211 30.1	21.2	82 48.8	45.2	117 39.2	12.7
J 08	202 04.4	309 44.4	06.1	226 30.8	20.4	97 51.6	45.3	132 41.8	12.7
U 09	217 06.8	324 43.5 . .	06.6	241 31.6 . .	19.7	112 54.4 . .	45.3	147 44.5 . .	12.6
E 10	232 09.3	339 42.6	07.1	256 32.3	19.0	127 57.2	45.3	162 47.2	12.6
V 11	247 11.8	354 41.7	07.6	271 33.1	18.3	143 00.0	45.4	177 49.9	12.6
E 12	262 14.2	9 40.8	S22 08.0	286 33.8	S11 17.6	158 02.8	N22 45.4	192 52.5	N20 12.6
S 13	277 16.7	24 39.9	08.5	301 34.6	16.9	173 05.5	45.4	207 55.2	12.5
14	292 19.1	39 39.0	09.0	316 35.3	16.2	188 08.3	45.5	222 57.9	12.5
15	307 21.6	54 38.1 . .	09.4	331 36.1 . .	15.5	203 11.1 . .	45.5	238 00.6 . .	12.5
16	322 24.1	69 37.2	09.9	346 36.8	14.7	218 13.9	45.5	253 03.2	12.5
17	337 26.5	84 36.3	10.4	1 37.6	14.0	233 16.7	45.6	268 05.9	12.5
18	352 29.0	99 35.4	S22 10.9	16 38.3	S11 13.3	248 19.5	N22 45.6	283 08.6	N20 12.4
19	7 31.5	114 34.5	11.3	31 39.1	12.6	263 22.2	45.7	298 11.3	12.4
20	22 33.9	129 33.6	11.8	46 39.8	11.9	278 25.0	45.7	313 13.9	12.4
21	37 36.4	144 32.7 . .	12.2	61 40.6 . .	11.2	293 27.8 . .	45.7	328 16.6 . .	12.4
22	52 38.9	159 31.8	12.7	76 41.4	10.5	308 30.6	45.8	343 19.3	12.3
23	67 41.3	174 30.9	13.2	91 42.1	09.7	323 33.4	45.8	358 22.0	12.3
14 00	82 43.8	189 30.0	S22 13.6	106 42.9	S11 09.0	338 36.2	N22 45.8	13 24.6	N20 12.3
01	97 46.3	204 29.1	14.1	121 43.6	08.3	353 38.9	45.9	28 27.3	12.3
02	112 48.7	219 28.2	14.5	136 44.4	07.6	8 41.7	45.9	43 30.0	12.2
03	127 51.2	234 27.3 . .	15.0	151 45.1 . .	06.9	23 44.5 . .	45.9	58 32.7 . .	12.2
04	142 53.6	249 26.4	15.5	166 45.9	06.2	38 47.3	46.0	73 35.3	12.2
05	157 56.1	264 25.5	15.9	181 46.6	05.5	53 50.1	46.0	88 38.0	12.2
06	172 58.6	279 24.6	S22 16.4	196 47.4	S11 04.7	68 52.9	N22 46.0	103 40.7	N20 12.2
07	188 01.0	294 23.7	16.8	211 48.1	04.0	83 55.7	46.1	118 43.4	12.1
V 08	203 03.5	309 22.8	17.3	226 48.9	03.3	98 58.5	46.1	133 46.0	12.1
I 09	218 06.0	324 21.9 . .	17.7	241 49.6 . .	02.6	114 01.2 . .	46.1	148 48.7 . .	12.1
E 10	233 08.4	339 21.0	18.2	256 50.4	01.9	129 04.0	46.2	163 51.4	12.1
R 11	248 10.9	354 20.1	18.6	271 51.1	01.2	144 06.8	46.2	178 54.1	12.0
N 12	263 13.4	9 19.2	S22 19.1	286 51.9	S11 00.4	159 09.6	N22 46.2	193 56.7	N20 12.0
E 13	278 15.8	24 18.3	19.5	301 52.6	10 59.7	174 12.4	46.3	208 59.4	12.0
S 14	293 18.3	39 17.4	20.0	316 53.4	59.0	189 15.2	46.3	224 02.1	12.0
15	308 20.8	54 16.5 . .	20.4	331 54.1 . .	58.3	204 18.0 . .	46.3	239 04.8 . .	12.0
16	323 23.2	69 15.6	20.8	346 54.9	57.6	219 20.8	46.4	254 07.4	11.9
17	338 25.7	84 14.7	21.3	1 55.6	56.9	234 23.5	46.4	269 10.1	11.9
18	353 28.1	99 13.8	S22 21.7	16 56.4	S10 56.1	249 26.3	N22 46.4	284 12.8	N20 11.9
19	8 30.6	114 12.9	22.2	31 57.1	55.4	264 29.1	46.5	299 15.5	11.9
20	23 33.1	129 11.9	22.6	46 57.9	54.7	279 31.9	46.5	314 18.1	11.8
21	38 35.5	144 11.0 . .	23.0	61 58.7 . .	54.0	294 34.7 . .	46.6	329 20.8 . .	11.8
22	53 38.0	159 10.1	23.5	76 59.4	53.3	309 37.5	46.6	344 23.5	11.8
23	68 40.5	174 09.2	23.9	92 00.2	52.6	324 40.3	46.6	359 26.2	11.8
	h m								
Pas. Mer.	18 30.0	*v* −0.9	*d* 0.5	*v* 0.8	*d* 0.7	*v* 2.8	*d* 0.0	*v* 2.7	*d* 0.0

ESTRELLAS

Nombre	A.H.S.	Dec.
	° ′	° ′
Acamar	315 24.8	S40 18.0
Achernar	335 33.1	S57 14.0
Acrux	173 19.8	S63 06.2
Adhara	255 19.3	S28 58.4
Aldebaran	290 59.5	N16 30.8
Alioth	166 28.7	N55 56.8
Alkaid	153 06.3	N49 18.1
Al Na'ir	27 55.2	S46 57.4
Alnilam	275 55.2	S 1 12.0
Alphard	218 04.8	S 8 39.9
Alphecca	126 19.0	N26 42.5
Alpheratz	357 52.9	N29 06.1
Altair	62 17.4	N 8 52.4
Ankaa	353 24.5	S42 18.1
Antares	112 37.8	S26 26.1
Arcturus	146 04.2	N19 10.4
Atria	107 48.4	S69 01.8
Avior	234 21.3	S59 30.7
Bellatrix	278 41.4	N 6 21.1
Betelgeuse	271 10.8	N 7 24.4
Canopus	263 59.6	S52 41.7
Capella	280 47.4	N46 00.0
Deneb	49 38.0	N45 17.4
Denebola	182 42.9	N14 33.7
Diphda	349 04.8	S17 58.8
Dubhe	194 02.5	N61 44.2
Elnath	278 23.7	N28 36.5
Eltanin	90 50.9	N51 29.4
Enif	33 56.2	N 9 53.0
Fomalhaut	15 34.0	S29 37.0
Gacrux	172 11.3	S57 07.0
Gienah	176 01.7	S17 32.9
Hadar	149 01.4	S60 22.6
Hamal	328 10.8	N23 28.3
Kaus Aust.	83 56.2	S34 23.1
Kochab	137 20.4	N74 08.7
Markab	13 47.4	N15 12.9
Menkar	314 24.3	N 4 05.8
Menkent	148 18.6	S36 22.5
Miaplacidus	221 41.2	S69 43.2
Mirfak	308 53.0	N49 52.2
Nunki	76 09.9	S26 17.7
Peacock	53 33.9	S56 44.0
Pollux	243 38.5	N28 01.3
Procyon	245 08.9	N 5 13.2
Rasalhague	96 15.2	N12 33.6
Regulus	207 53.0	N11 57.5
Rigel	281 20.4	S 8 12.0
Rigil Kent.	140 04.9	S60 50.3
Sabik	102 23.3	S15 43.6
Schedar	349 50.8	N56 33.1
Shaula	96 34.7	S37 06.3
Sirius	258 41.4	S16 43.0
Spica	158 41.0	S11 10.1
Suhail	222 58.9	S43 26.1
Vega	80 45.5	N38 47.2
Zuben'ubi	137 15.8	S16 02.8

	A.H.S.	Pas. Mer.
	° ′	h m
Venus	108 06.9	11 21
Marte	24 40.2	16 53
Júpiter	255 44.7	1 30
Saturno	290 35.8	23 07

T.U.	SOL				LUNA						
	A.H.G.		Dec.		A.H.G.	v	Dec.	d	P.H.		
d h	° ′		° ′		° ′	′	° ′	′	′		
MIERCOLES 12 00	181 36.9		S23 03.8		217 46.8	10.4	S12 42.6	12.3	58.3		
01	196 36.6		04.0		232 16.2	10.4	12 54.9	12.1	58.3		
02	211 36.3		04.2		246 45.6	10.4	13 07.0	12.0	58.3		
03	226 36.1	. .	04.4		261 15.0	10.3	13 19.0	12.0	58.3		
04	241 35.8		04.6		275 44.3	10.3	13 31.0	11.9	58.2		
05	256 35.5		04.7		290 13.6	10.2	13 42.9	11.8	58.2		
06	271 35.2		S23 04.9		304 42.8	10.3	S13 54.7	11.8	58.2		
07	286 34.9		05.1		319 12.1	10.1	14 06.5	11.6	58.2		
08	301 34.6		05.3		333 41.2	10.2	14 18.1	11.6	58.2		
09	316 34.3	. .	05.5		348 10.4	10.0	14 29.7	11.5	58.2		
10	331 34.0		05.7		2 39.4	10.1	14 41.2	11.4	58.1		
11	346 33.7		05.8		17 08.5	10.0	14 52.6	11.3	58.1		
12	1 33.4		S23 06.0		31 37.5	10.0	S15 03.9	11.2	58.1		
13	16 33.1		06.2		46 06.5	9.9	15 15.1	11.2	58.1		
14	31 32.8		06.4		60 35.4	9.9	15 26.3	11.0	58.1		
15	46 32.5	. .	06.6		75 04.3	9.8	15 37.3	11.0	58.0		
16	61 32.2		06.7		89 33.1	9.8	15 48.3	10.9	58.0		
17	76 32.0		06.9		104 01.9	9.8	15 59.2	10.7	58.0		
18	91 31.7		S23 07.1		118 30.7	9.7	S16 09.9	10.7	58.0		
19	106 31.4		07.3		132 59.4	9.7	16 20.6	10.6	58.0		
20	121 31.1		07.5		147 28.1	9.6	16 31.2	10.5	58.0		
21	136 30.8	. .	07.6		161 56.7	9.6	16 41.7	10.4	57.9		
22	151 30.5		07.8		176 25.3	9.5	16 52.1	10.3	57.9		
23	166 30.2		08.0		190 53.8	9.6	17 02.4	10.1	57.9		
JUEVES 13 00	181 29.9		S23 08.1		205 22.4	9.4	S17 12.5	10.1	57.9		
01	196 29.6		08.3		219 50.8	9.4	17 22.6	10.0	57.9		
02	211 29.3		08.5		234 19.2	9.4	17 32.6	9.9	57.8		
03	226 29.0	. .	08.7		248 47.6	9.4	17 42.5	9.8	57.8		
04	241 28.7		08.8		263 16.0	9.3	17 52.3	9.7	57.8		
05	256 28.4		09.0		277 44.3	9.2	18 02.0	9.5	57.8		
06	271 28.1		S23 09.2		292 12.5	9.3	S18 11.5	9.5	57.8		
07	286 27.8		09.3		306 40.8	9.2	18 21.0	9.3	57.7		
08	301 27.5		09.5		321 09.0	9.1	18 30.3	9.3	57.7		
09	316 27.2	. .	09.7		335 37.1	9.1	18 39.6	9.1	57.7		
10	331 26.9		09.8		350 05.2	9.1	18 48.7	9.0	57.7		
11	346 26.6		10.0		4 33.3	9.0	18 57.7	8.9	57.7		
12	1 26.3		S23 10.1		19 01.3	9.0	S19 06.6	8.8	57.6		
13	16 26.0		10.3		33 29.3	8.9	19 15.4	8.7	57.6		
14	31 25.7		10.5		47 57.2	8.9	19 24.1	8.6	57.6		
15	46 25.4	. .	10.6		62 25.1	8.9	19 32.7	8.5	57.6		
16	61 25.2		10.8		76 53.0	8.9	19 41.2	8.3	57.6		
17	76 24.9		10.9		91 20.9	8.8	19 49.5	8.2	57.5		
18	91 24.6		S23 11.1		105 48.7	8.7	S19 57.7	8.1	57.5		
19	106 24.3		11.3		120 16.4	8.8	20 05.8	8.0	57.5		
20	121 24.0		11.4		134 44.2	8.7	20 13.8	7.9	57.5		
21	136 23.7	. .	11.6		149 11.9	8.6	20 21.7	7.7	57.4		
22	151 23.4		11.7		163 39.5	8.7	20 29.4	7.6	57.4		
23	166 23.1		11.9		178 07.2	8.6	20 37.0	7.5	57.4		
VIERNES 14 00	181 22.8		S23 12.0		192 34.8	8.5	S20 44.5	7.4	57.4		
01	196 22.5		12.2		207 02.3	8.6	20 51.9	7.3	57.4		
02	211 22.2		12.3		221 29.9	8.5	20 59.2	7.1	57.3		
03	226 21.9	. .	12.5		235 57.4	8.5	21 06.3	7.0	57.3		
04	241 21.6		12.6		250 24.9	8.4	21 13.3	6.9	57.3		
05	256 21.3		12.8		264 52.3	8.4	21 20.2	6.7	57.3		
06	271 21.0		S23 12.9		279 19.7	8.4	S21 26.9	6.7	57.2		
07	286 20.7		13.1		293 47.1	8.4	21 33.6	6.5	57.2		
08	301 20.4		13.2		308 14.5	8.3	21 40.1	6.3	57.2		
09	316 20.1	. .	13.4		322 41.8	8.4	21 46.4	6.3	57.2		
10	331 19.8		13.5		337 09.2	8.3	21 52.7	6.1	57.2		
11	346 19.5		13.7		351 36.5	8.2	21 58.8	6.0	57.1		
12	1 19.2		S23 13.8		6 03.7	8.3	S22 04.8	5.8	57.1		
13	16 18.9		13.9		20 31.0	8.2	22 10.6	5.8	57.1		
14	31 18.6		14.1		34 58.2	8.3	22 16.4	5.6	57.1		
15	46 18.3	. .	14.2		49 25.5	8.2	22 22.0	5.4	57.0		
16	61 18.0		14.4		63 52.7	8.1	22 27.4	5.3	57.0		
17	76 17.7		14.5		78 19.8	8.2	S22 32.7	5.2	57.0		
18	91 17.4		S23 14.6								
19	106 17.1		14.8								
20	121 16.8		14.9								
21	136 16.5	. .	15.1								
22	151 16.2		15.2								
23	166 15.9		15.3								
	SD 16.3		d 0.2		SD	15.8	15.7		15.6		

Un eclipse anular de Sol ocurre en esta fecha. Ver pág. 5

Lat.	Crepúsculo Náutico	Crepúsculo Civil	Orto Sol	Orto Luna 12	Orto Luna 13	Orto Luna 14	Orto Luna 15
°	h m	h m	h m	h m	h m	h m	h m
N 72	08 17	10 41	▬	07 10	▬	▬	▬
N 70	07 58	09 44	▬	06 38	09 17	▬	▬
68	07 42	09 10	▬	06 16	08 24	▬	▬
66	07 30	08 46	10 23	05 58	07 52	09 52	12 11
64	07 19	08 27	09 43	05 44	07 28	09 12	10 46
62	07 09	08 11	09 16	05 32	07 10	08 45	10 09
60	07 01	07 58	08 55	05 22	06 55	08 24	09 43
N 58	06 54	07 46	08 38	05 13	06 42	08 07	09 22
56	06 47	07 36	08 23	05 05	06 31	07 52	09 05
54	06 41	07 27	08 11	04 59	06 21	07 40	08 51
52	06 36	07 19	08 00	04 52	06 12	07 29	08 38
50	06 30	07 12	07 50	04 47	06 05	07 19	08 27
45	06 19	06 56	07 30	04 35	05 48	06 59	08 04
N 40	06 09	06 43	07 13	04 26	05 35	06 42	07 46
35	05 59	06 31	06 59	04 17	05 23	06 28	07 30
30	05 51	06 21	06 47	04 10	05 14	06 16	07 17
20	05 35	06 02	06 26	03 58	04 57	05 56	06 54
N 10	05 19	05 45	06 08	03 47	04 42	05 38	06 35
0	05 02	05 28	05 50	03 37	04 29	05 22	06 16
S 10	04 43	05 10	05 33	03 27	04 15	05 05	05 58
20	04 21	04 50	05 14	03 16	04 01	04 48	05 39
30	03 52	04 25	04 53	03 04	03 44	04 28	05 16
35	03 34	04 10	04 40	02 57	03 35	04 16	05 03
40	03 11	03 52	04 25	02 50	03 24	04 03	04 48
45	02 41	03 30	04 07	02 41	03 11	03 47	04 30
S 50	01 56	03 01	03 45	02 30	02 56	03 28	04 08
52	01 30	02 46	03 34	02 25	02 49	03 19	03 57
54	00 48	02 28	03 22	02 19	02 41	03 09	03 45
56	////	02 07	03 08	02 13	02 33	02 58	03 32
58	////	01 38	02 52	02 07	02 23	02 45	03 16
S 60	////	00 53	02 32	01 59	02 11	02 29	02 57

Lat.	Ocaso Sol	Crepúsculo Civil	Crepúsculo Náutico	Ocaso Luna 12	Ocaso Luna 13	Ocaso Luna 14	Ocaso Luna 15
°	h m	h m	h m	h m	h m	h m	h m
N 72	▬	13 07	15 31	12 06	▬	▬	▬
N 70	▬	14 04	15 50	12 39	11 50	▬	▬
68	▬	14 38	16 06	13 04	12 44	▬	▬
66	13 25	15 02	16 19	13 23	13 17	13 09	12 44
64	14 05	15 21	16 29	13 38	13 41	13 49	14 09
62	14 32	15 37	16 39	13 51	14 01	14 17	14 46
60	14 53	15 51	16 47	14 02	14 17	14 39	15 13
N 58	15 11	16 02	16 54	14 12	14 30	14 56	15 34
56	15 25	16 12	17 01	14 20	14 42	15 11	15 51
54	15 37	16 21	17 07	14 28	14 52	15 24	16 05
52	15 48	16 29	17 13	14 34	15 01	15 35	16 18
50	15 58	16 36	17 18	14 41	15 09	15 45	16 29
45	16 19	16 52	17 29	14 54	15 27	16 06	16 52
N 40	16 35	17 06	17 40	15 05	15 41	16 23	17 11
35	16 49	17 17	17 49	15 14	15 54	16 38	17 27
30	17 01	17 28	17 58	15 22	16 04	16 50	17 41
20	17 22	17 46	18 14	15 37	16 23	17 12	18 04
N 10	17 41	18 04	18 30	15 49	16 39	17 30	18 24
0	17 58	18 20	18 47	16 01	16 54	17 48	18 43
S 10	18 15	18 38	19 05	16 13	17 09	18 05	19 01
20	18 34	18 59	19 28	16 26	17 25	18 24	19 21
30	18 56	19 23	19 57	16 40	17 44	18 46	19 45
35	19 09	19 38	20 15	16 49	17 55	18 58	19 58
40	19 24	19 56	20 38	16 59	18 07	19 13	20 14
45	19 42	20 19	21 08	17 10	18 22	19 31	20 33
S 50	20 04	20 48	21 53	17 24	18 40	19 52	20 56
52	20 15	21 03	22 20	17 31	18 49	20 03	21 07
54	20 27	21 21	23 03	17 38	18 59	20 14	21 20
56	20 41	21 42	////	17 46	19 10	20 28	21 35
58	20 57	22 11	////	17 55	19 22	20 43	21 52
S 60	21 17	22 58	////	18 06	19 37	21 02	22 13

Día	SOL E. T. (+) 00h	SOL E. T. (+) 12h	SOL Pas. Mer.	LUNA Pas. Sup.	LUNA Mer. Inf.	LUNA Edad	LUNA Fase
d	m s	m s	h m	h m	h m	d	%
12	06 28	06 14	11 54	09 49	22 15	27	6
13	06 00	05 46	11 54	10 41	23 08	28	2
14	05 32	05 17	11 55	11 35	24 02	29	0

T.U.	ARIES	VENUS −3.9		MARTE +0.6		JUPITER −2.7		SATURNO −0.4	
	A.H.G.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
15 00	83 42.9	189 08.3	S22 24.3	107 00.9	S10 51.8	339 43.1	N22 46.7	14 28.8	N20 11.8
01	98 45.4	204 07.4	24.8	122 01.7	51.1	354 45.9	46.7	29 31.5	11.7
02	113 47.9	219 06.5	25.2	137 02.4	50.4	9 48.6	46.7	44 34.2	11.7
03	128 50.3	234 05.6 . .	25.6	152 03.2 . .	49.7	24 51.4 . .	46.8	59 36.8 . .	11.7
04	143 52.8	249 04.7	26.1	167 03.9	49.0	39 54.2	46.8	74 39.5	11.7
05	158 55.3	264 03.8	26.5	182 04.7	48.3	54 57.0	46.8	89 42.2	11.6
06	173 57.7	279 02.9	S22 26.9	197 05.4	S10 47.5	69 59.8	N22 46.9	104 44.9	N20 11.6
07	189 00.2	294 01.9	27.3	212 06.2	46.8	85 02.6	46.9	119 47.5	11.6
S 08	204 02.6	309 01.0	27.8	227 06.9	46.1	100 05.4	46.9	134 50.2	11.6
A 09	219 05.1	324 00.1 . .	28.2	242 07.7 . .	45.4	115 08.2 . .	47.0	149 52.9 . .	11.5
B 10	234 07.6	338 59.2	28.6	257 08.5	44.7	130 11.0	47.0	164 55.6	11.5
A 11	249 10.0	353 58.3	29.0	272 09.2	43.9	145 13.8	47.0	179 58.2	11.5
12	264 12.5	8 57.4	S22 29.4	287 10.0	S10 43.2	160 16.6	N22 47.1	195 00.9	N20 11.5
D 13	279 15.0	23 56.5	29.9	302 10.7	42.5	175 19.3	47.1	210 03.6	11.5
O 14	294 17.4	38 55.6	30.3	317 11.5	41.8	190 22.1	47.1	225 06.2	11.4
15	309 19.9	53 54.6 . .	30.7	332 12.2 . .	41.1	205 24.9 . .	47.2	240 08.9 . .	11.4
16	324 22.4	68 53.7	31.1	347 13.0	40.3	220 27.7	47.2	255 11.6	11.4
17	339 24.8	83 52.8	31.5	2 13.7	39.6	235 30.5	47.2	270 14.3	11.4
18	354 27.3	98 51.9	S22 31.9	17 14.5	S10 38.9	250 33.3	N22 47.3	285 16.9	N20 11.3
19	9 29.8	113 51.0	32.3	32 15.3	38.2	265 36.1	47.3	300 19.6	11.3
20	24 32.2	128 50.1	32.7	47 16.0	37.5	280 38.9	47.4	315 22.3	11.3
21	39 34.7	143 49.2 . .	33.2	62 16.8 . .	36.7	295 41.7 . .	47.4	330 25.0 . .	11.3
22	54 37.1	158 48.2	33.6	77 17.5	36.0	310 44.5	47.4	345 27.6	11.3
23	69 39.6	173 47.3	34.0	92 18.3	35.3	325 47.3	47.5	0 30.3	11.2
16 00	84 42.1	188 46.4	S22 34.4	107 19.0	S10 34.6	340 50.1	N22 47.5	15 33.0	N20 11.2
01	99 44.5	203 45.5	34.8	122 19.8	33.9	355 52.9	47.5	30 35.6	11.2
02	114 47.0	218 44.6	35.2	137 20.5	33.1	10 55.7	47.6	45 38.3	11.2
03	129 49.5	233 43.7 . .	35.6	152 21.3 . .	32.4	25 58.5 . .	47.6	60 41.0 . .	11.1
04	144 51.9	248 42.7	36.0	167 22.1	31.7	41 01.3	47.6	75 43.7	11.1
05	159 54.4	263 41.8	36.4	182 22.8	31.0	56 04.1	47.7	90 46.3	11.1
06	174 56.9	278 40.9	S22 36.8	197 23.6	S10 30.2	71 06.8	N22 47.7	105 49.0	N20 11.1
07	189 59.3	293 40.0	37.2	212 24.3	29.5	86 09.6	47.7	120 51.7	11.1
D 08	205 01.8	308 39.1	37.6	227 25.1	28.8	101 12.4	47.8	135 54.3	11.0
O 09	220 04.3	323 38.1 . .	38.0	242 25.8 . .	28.1	116 15.2 . .	47.8	150 57.0 . .	11.0
M 10	235 06.7	338 37.2	38.4	257 26.6	27.4	131 18.0	47.8	165 59.7	11.0
I 11	250 09.2	353 36.3	38.7	272 27.4	26.6	146 20.8	47.9	181 02.4	11.0
12	265 11.6	8 35.4	S22 39.1	287 28.1	S10 25.9	161 23.6	N22 47.9	196 05.0	N20 10.9
N 13	280 14.1	23 34.5	39.5	302 28.9	25.2	176 26.4	47.9	211 07.7	10.9
G 14	295 16.6	38 33.5	39.9	317 29.6	24.5	191 29.2	48.0	226 10.4	10.9
O 15	310 19.0	53 32.6 . .	40.3	332 30.4 . .	23.7	206 32.0 . .	48.0	241 13.0 . .	10.9
16	325 21.5	68 31.7	40.7	347 31.1	23.0	221 34.8	48.1	256 15.7	10.9
17	340 24.0	83 30.8	41.1	2 31.9	22.3	236 37.6	48.1	271 18.4	10.8
18	355 26.4	98 29.8	S22 41.5	17 32.7	S10 21.6	251 40.4	N22 48.1	286 21.1	N20 10.8
19	10 28.9	113 28.9	41.8	32 33.4	20.8	266 43.2	48.2	301 23.7	10.8
20	25 31.4	128 28.0	42.2	47 34.2	20.1	281 46.0	48.2	316 26.4	10.8
21	40 33.8	143 27.1 . .	42.6	62 34.9 . .	19.4	296 48.8 . .	48.2	331 29.1 . .	10.8
22	55 36.3	158 26.2	43.0	77 35.7	18.7	311 51.6	48.3	346 31.7	10.7
23	70 38.8	173 25.2	43.4	92 36.4	17.9	326 54.4	48.3	1 34.4	10.7
17 00	85 41.2	188 24.3	S22 43.7	107 37.2	S10 17.2	341 57.2	N22 48.3	16 37.1	N20 10.7
01	100 43.7	203 23.4	44.1	122 38.0	16.5	357 00.0	48.4	31 39.7	10.7
02	115 46.1	218 22.5	44.5	137 38.7	15.8	12 02.8	48.4	46 42.4	10.6
03	130 48.6	233 21.5 . .	44.8	152 39.5 . .	15.1	27 05.6 . .	48.4	61 45.1 . .	10.6
04	145 51.1	248 20.6	45.2	167 40.2	14.3	42 08.4	48.5	76 47.8	10.6
05	160 53.5	263 19.7	45.6	182 41.0	13.6	57 11.2	48.5	91 50.4	10.6
06	175 56.0	278 18.8	S22 46.0	197 41.8	S10 12.9	72 14.0	N22 48.5	106 53.1	N20 10.6
07	190 58.5	293 17.8	46.3	212 42.5	12.2	87 16.8	48.6	121 55.8	10.5
08	206 00.9	308 16.9	46.7	227 43.3	11.4	102 19.6	48.6	136 58.4	10.5
L 09	221 03.4	323 16.0 . .	47.1	242 44.0 . .	10.7	117 22.4 . .	48.6	152 01.1 . .	10.5
U 10	236 05.9	338 15.0	47.4	257 44.8	10.0	132 25.2	48.7	167 03.8	10.5
N 11	251 08.3	353 14.1	47.8	272 45.5	09.2	147 28.0	48.7	182 06.4	10.4
12	266 10.8	8 13.2	S22 48.1	287 46.3	S10 08.5	162 30.8	N22 48.8	197 09.1	N20 10.4
E 13	281 13.2	23 12.3	48.5	302 47.1	07.8	177 33.6	48.8	212 11.8	10.4
S 14	296 15.7	38 11.3	48.9	317 47.8	07.1	192 36.4	48.8	227 14.5	10.4
15	311 18.2	53 10.4 . .	49.2	332 48.6 . .	06.3	207 39.2 . .	48.9	242 17.1 . .	10.4
16	326 20.6	68 09.5	49.6	347 49.3	05.6	222 42.0	48.9	257 19.8	10.3
17	341 23.1	83 08.5	49.9	2 50.1	04.9	237 44.8	48.9	272 22.5	10.3
18	356 25.6	98 07.6	S22 50.3	17 50.9	S10 04.2	252 47.6	N22 49.0	287 25.1	N20 10.3
19	11 28.0	113 06.7	50.6	32 51.6	03.4	267 50.4	49.0	302 27.8	10.3
20	26 30.5	128 05.8	51.0	47 52.4	02.7	282 53.2	49.0	317 30.5	10.2
21	41 33.0	143 04.8 . .	51.4	62 53.1 . .	02.0	297 56.0 . .	49.1	332 33.1 . .	10.2
22	56 35.4	158 03.9	51.7	77 53.9	01.3	312 58.8	49.1	347 35.8	10.2
23	71 37.9	173 03.0	52.0	92 54.7	00.5	328 01.6	49.1	2 38.5	10.2
	h m								
Pas. Mer.	18 18.2	v −0.9	d 0.4	v 0.8	d 0.7	v 2.8	d 0.0	v 2.7	d 0.0

ESTRELLAS		
Nombre	A.H.S.	Dec.
	° ′	° ′
Acamar	315 24.8	S40 18.0
Achernar	335 33.1	S57 14.0
Acrux	173 19.8	S63 06.2
Adhara	255 19.3	S28 58.4
Aldebaran	290 59.5	N16 30.8
Alioth	166 28.7	N55 56.8
Alkaid	153 06.2	N49 18.1
Al Na'ir	27 55.2	S46 57.4
Alnilam	275 55.2	S 1 12.1
Alphard	218 04.8	S 8 39.9
Alphecca	126 19.0	N26 42.5
Alpheratz	357 52.9	N29 06.1
Altair	62 17.4	N 8 52.4
Ankaa	353 24.5	S42 18.1
Antares	112 37.8	S26 26.1
Arcturus	146 04.2	N19 10.4
Atria	107 48.4	S69 01.7
Avior	234 21.3	S59 30.7
Bellatrix	278 41.4	N 6 21.1
Betelgeuse	271 10.8	N 7 24.4
Canopus	263 59.6	S52 41.7
Capella	280 47.4	N46 00.0
Deneb	49 38.0	N45 17.4
Denebola	182 42.9	N14 33.7
Diphda	349 04.8	S17 58.8
Dubhe	194 02.5	N61 44.2
Elnath	278 23.7	N28 36.5
Eltanin	90 50.9	N51 29.4
Enif	33 56.2	N 9 53.0
Fomalhaut	15 34.0	S29 37.0
Gacrux	172 11.3	S57 07.0
Gienah	176 01.7	S17 32.9
Hadar	149 01.3	S60 22.6
Hamal	328 10.8	N23 28.3
Kaus Aust.	83 56.2	S34 23.1
Kochab	137 20.4	N74 08.7
Markab	13 47.4	N15 12.9
Menkar	314 24.3	N 4 05.8
Menkent	148 18.6	S36 22.5
Miaplacidus	221 41.1	S69 43.2
Mirfak	308 53.0	N49 52.2
Nunki	76 09.9	S26 17.7
Peacock	53 33.9	S56 44.0
Pollux	243 38.5	N28 01.3
Procyon	245 08.9	N 5 13.2
Rasalhague	96 15.2	N12 33.5
Regulus	207 53.0	N11 57.5
Rigel	281 20.4	S 8 12.0
Rigil Kent.	140 04.8	S60 50.3
Sabik	102 23.3	S15 43.6
Schedar	349 50.8	N56 33.1
Shaula	96 34.7	S37 06.3
Sirius	258 41.4	S16 43.1
Spica	158 41.0	S11 10.1
Suhail	222 58.9	S43 26.2
Vega	80 45.5	N38 47.2
Zuben'ubi	137 15.7	S16 02.8

	A.H.S.	Pas. Mer.
	° ′	h m
Venus	104 04.3	11 26
Marte	22 37.0	16 50
Júpiter	256 08.0	1 16
Saturno	290 50.9	22 54

T.U.	SOL				LUNA					
	A.H.G.		Dec.		A.H.G.	v	Dec.		d	P.H.
d h	°	′	°	′	°	′	′	° ′	′	′
15 00	181	15.6	S23	15.5	179	29.7	8.1	S23 06.3	4.3	56.8
01	196	15.3		15.6	193	56.8	8.1	23 10.6	4.1	56.8
02	211	15.0		15.7	208	23.9	8.1	23 14.7	4.0	56.8
03	226	14.7	. .	15.8	222	51.0	8.0	23 18.7	3.8	56.8
04	241	14.4		16.0	237	18.0	8.1	23 22.5	3.8	56.7
05	256	14.1		16.1	251	45.1	8.0	23 26.3	3.5	56.7
06	271	13.8	S23	16.2	266	12.1	8.1	S23 29.8	3.5	56.7
S 07	286	13.5		16.4	280	39.2	8.1	23 33.3	3.3	56.7
08	301	13.2		16.5	295	06.3	8.0	23 36.6	3.2	56.6
A 09	316	12.9	. .	16.6	309	33.3	8.1	23 39.8	3.0	56.6
10	331	12.6		16.7	324	00.4	8.1	23 42.8	2.9	56.6
B 11	346	12.3		16.9	338	27.5	8.1	23 45.7	2.8	56.6
A 12	1	11.9	S23	17.0	352	54.6	8.0	S23 48.5	2.6	56.5
13	16	11.6		17.1	7	21.6	8.1	23 51.1	2.5	56.5
D 14	31	11.3		17.2	21	48.7	8.1	23 53.6	2.3	56.5
15	46	11.0	. .	17.4	36	15.8	8.1	23 55.9	2.2	56.5
O 16	61	10.7		17.5	50	42.9	8.2	23 58.1	2.1	56.4
17	76	10.4		17.6	65	10.1	8.1	24 00.2	1.9	56.4
18	91	10.1	S23	17.7	79	37.2	8.1	S24 02.1	1.8	56.4
19	106	09.8		17.8	94	04.3	8.2	24 03.9	1.7	56.4
20	121	09.5		18.0	108	31.5	8.2	24 05.6	1.5	56.3
21	136	09.2	. .	18.1	122	58.7	8.2	24 07.1	1.4	56.3
22	151	08.9		18.2	137	25.9	8.2	24 08.5	1.3	56.3
23	166	08.6		18.3	151	53.1	8.3	24 09.8	1.1	56.3
16 00	181	08.3	S23	18.4	166	20.4	8.2	S24 10.9	1.0	56.2
01	196	08.0		18.5	180	47.6	8.3	24 11.9	0.8	56.2
02	211	07.7		18.6	195	14.9	8.3	24 12.7	0.8	56.2
03	226	07.4	. .	18.8	209	42.2	8.4	24 13.5	0.5	56.2
04	241	07.1		18.9	224	09.6	8.3	24 14.0	0.5	56.1
05	256	06.8		19.0	238	36.9	8.4	24 14.5	0.3	56.1
06	271	06.5	S23	19.1	253	04.3	8.4	S24 14.8	0.2	56.1
07	286	06.2		19.2	267	31.7	8.5	24 15.0	0.0	56.1
D 08	301	05.9		19.3	281	59.2	8.5	24 15.0	0.1	56.1
O 09	316	05.6	. .	19.4	296	26.7	8.5	24 14.9	0.2	56.0
M 10	331	05.3		19.5	310	54.2	8.6	24 14.7	0.3	56.0
I 11	346	05.0		19.6	325	21.8	8.5	24 14.4	0.5	56.0
N 12	1	04.7	S23	19.7	339	49.3	8.7	S24 13.9	0.7	56.0
G 13	16	04.4		19.8	354	17.0	8.6	24 13.2	0.7	55.9
O 14	31	04.0		19.9	8	44.6	8.7	24 12.5	0.9	55.9
15	46	03.7	. .	20.0	23	12.3	8.8	24 11.6	1.0	55.9
16	61	03.4		20.1	37	40.1	8.8	24 10.6	1.1	55.9
17	76	03.1		20.2	52	07.9	8.8	24 09.5	1.3	55.8
18	91	02.8	S23	20.3	66	35.7	8.9	S24 08.2	1.4	55.8
19	106	02.5		20.4	81	03.6	8.9	24 06.8	1.5	55.8
20	121	02.2		20.5	95	31.5	8.9	24 05.3	1.7	55.8
21	136	01.9	. .	20.6	109	59.4	9.1	24 03.6	1.8	55.7
22	151	01.6		20.7	124	27.5	9.0	24 01.8	1.9	55.7
23	166	01.3		20.8	138	55.5	9.1	23 59.9	2.0	55.7
17 00	181	01.0	S23	20.9	153	23.6	9.2	S23 57.9	2.2	55.7
01	196	00.7		21.0	167	51.8	9.2	23 55.7	2.3	55.7
02	211	00.4		21.1	182	20.0	9.2	23 53.4	2.4	55.6
03	226	00.1	. .	21.2	196	48.2	9.3	23 51.0	2.5	55.6
04	240	59.8		21.3	211	16.5	9.4	23 48.5	2.7	55.6
05	255	59.5		21.4	225	44.9	9.4	23 45.8	2.7	55.6
06	270	59.2	S23	21.5	240	13.3	9.5	S23 43.1	2.9	55.5
07	285	58.8		21.5	254	41.8	9.5	23 40.2	3.1	55.5
L 08	300	58.5		21.6	269	10.3	9.6	23 37.1	3.1	55.5
09	315	58.2	. .	21.7	283	38.9	9.6	23 34.0	3.3	55.5
U 10	330	57.9		21.8	298	07.5	9.7	23 30.7	3.3	55.4
11	345	57.6		21.9	312	36.2	9.8	23 27.4	3.5	55.4
N 12	0	57.3	S23	22.0	327	05.0	9.8	S23 23.9	3.7	55.4
E 13	15	57.0		22.1	341	33.8	9.9	23 20.2	3.7	55.4
14	30	56.7		22.1	356	02.7	9.9	23 16.5	3.8	55.4
S 15	45	56.4	. .	22.2	10	31.6	10.0	23 12.7	4.0	55.3
16	60	56.1		22.3	25	00.6	10.1	23 08.7	4.1	55.3
17	75	55.8		22.4	39	29.7	10.1	23 04.6	4.2	55.3
18	90	55.5	S23	22.5	53	58.8	10.2	S23 00.4	4.3	55.3
19	105	55.2		22.6	68	28.0	10.2	22 56.1	4.4	55.3
20	120	54.9		22.6	82	57.2	10.3	22 51.7	4.5	55.2
21	135	54.5	. .	22.7	97	26.5	10.4	22 47.2	4.6	55.2
22	150	54.2		22.8	111	55.9	10.5	22 42.6	4.8	55.2
23	165	53.9		22.9	126	25.4	10.5	S22 37.8	4.8	55.2
	SD	16.3	d	0.1	SD		15.4	15.2		15.1

Lat.	Crepúsculo Náutico	Crepúsculo Civil	Orto Sol	Orto Luna 15	Orto Luna 16	Orto Luna 17	Orto Luna 18
°	h m	h m	h m	h m	h m	h m	h m
N 72	08 21	10 50	▬	▬	▬	▬	▬
N 70	08 02	09 49	▬	▬	▬	▬	▬
68	07 46	09 15	▬	▬	▬	▬	14 05
66	07 33	08 50	10 29	12 11	▬	13 21	13 10
64	07 22	08 30	09 48	10 46	11 53	12 24	12 37
62	07 12	08 14	09 20	10 09	11 12	11 51	12 12
60	07 04	08 01	08 58	09 43	10 45	11 26	11 53
N 58	06 56	07 49	08 41	09 22	10 23	11 07	11 37
56	06 50	07 39	08 26	09 05	10 05	10 51	11 23
54	06 44	07 30	08 14	08 51	09 50	10 37	11 11
52	06 38	07 22	08 03	08 38	09 37	10 24	11 01
50	06 33	07 14	07 53	08 27	09 26	10 14	10 51
45	06 21	06 58	07 32	08 04	09 02	09 51	10 31
N 40	06 11	06 45	07 15	07 46	08 43	09 33	10 15
35	06 01	06 33	07 01	07 30	08 27	09 18	10 02
30	05 53	06 23	06 49	07 17	08 13	09 04	09 50
20	05 36	06 04	06 28	06 54	07 50	08 42	09 29
N 10	05 20	05 46	06 09	06 35	07 30	08 22	09 11
0	05 03	05 29	05 52	06 16	07 11	08 04	08 55
S 10	04 44	05 11	05 34	05 58	06 52	07 46	08 38
20	04 22	04 51	05 16	05 39	06 32	07 26	08 20
30	03 53	04 26	04 54	05 16	06 08	07 03	07 59
35	03 34	04 11	04 41	05 03	05 55	06 50	07 47
40	03 11	03 53	04 26	04 48	05 39	06 35	07 33
45	02 41	03 30	04 08	04 30	05 20	06 16	07 17
S 50	01 56	03 01	03 45	04 08	04 57	05 53	06 56
52	01 28	02 46	03 34	03 57	04 45	05 42	06 47
54	00 43	02 28	03 22	03 45	04 32	05 30	06 36
56	////	02 06	03 08	03 32	04 18	05 16	06 23
58	////	01 37	02 51	03 16	04 00	04 59	06 09
S 60	////	00 48	02 31	02 57	03 39	04 39	05 51

Lat.	Ocaso Sol	Crepúsculo Civil	Crepúsculo Náutico	Ocaso Luna 15	Ocaso Luna 16	Ocaso Luna 17	Ocaso Luna 18
°	h m	h m	h m	h m	h m	h m	h m
N 72	▬	13 02	15 30	▬	▬	▬	▬
N 70	▬	14 02	15 50	▬	▬	▬	▬
68	▬	14 37	16 05	▬	▬	▬	16 18
66	13 22	15 02	16 18	12 44	▬	15 17	17 13
64	14 04	15 21	16 29	14 09	14 56	16 14	17 45
62	14 32	15 37	16 39	14 46	15 36	16 47	18 09
60	14 53	15 51	16 47	15 13	16 04	17 11	18 28
N 58	15 10	16 02	16 55	15 34	16 25	17 30	18 44
56	15 25	16 12	17 01	15 51	16 43	17 46	18 57
54	15 38	16 21	17 08	16 05	16 58	18 00	19 08
52	15 49	16 30	17 13	16 18	17 11	18 12	19 19
50	15 59	16 37	17 19	16 29	17 22	18 23	19 28
45	16 19	16 53	17 30	16 52	17 46	18 45	19 47
N 40	16 36	17 06	17 41	17 11	18 05	19 02	20 02
35	16 50	17 18	17 50	17 27	18 21	19 17	20 15
30	17 02	17 29	17 59	17 41	18 34	19 30	20 26
20	17 24	17 48	18 15	18 04	18 58	19 52	20 46
N 10	17 42	18 05	18 31	18 24	19 18	20 11	21 03
0	17 59	18 22	18 48	18 43	19 37	20 29	21 18
S 10	18 17	18 40	19 07	19 01	19 55	20 46	21 34
20	18 36	19 00	19 30	19 21	20 15	21 05	21 50
30	18 58	19 25	19 59	19 45	20 38	21 27	22 09
35	19 11	19 41	20 17	19 58	20 52	21 39	22 20
40	19 26	19 59	20 40	20 14	21 08	21 54	22 33
45	19 44	20 21	21 11	20 33	21 26	22 11	22 47
S 50	20 06	20 51	21 56	20 56	21 49	22 32	23 05
52	20 17	21 06	22 24	21 07	22 00	22 42	23 14
54	20 29	21 24	23 09	21 20	22 13	22 53	23 23
56	20 44	21 46	////	21 35	22 27	23 06	23 34
58	21 00	22 15	////	21 52	22 44	23 21	23 46
S 60	21 21	23 05	////	22 13	23 05	23 39	24 00

Día	SOL E. T. (+) 00h	SOL E. T. (+) 12h	SOL Pas. Mer.	LUNA Pas. Mer. Sup.	LUNA Pas. Mer. Inf.	LUNA Edad	LUNA Fase
d	m s	m s	h m	h m	h m	d	%
15	05 03	04 48	11 55	12 29	00 02	01	0
16	04 34	04 19	11 56	13 24	00 57	02	3
17	04 05	03 50	11 56	14 16	01 50	03	7

(MAR., MIE., JUE.) 18, 19, 20 DICIEMBRE DEL 2001

T.U.	ARIES	VENUS −3.9		MARTE +0.6		JUPITER −2.7		SATURNO −0.4	
	A.H.G.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
18 00	86 40.4	188 02.0	S22 52.4	107 55.4	S 9 59.8	343 04.4	N22 49.2	17 41.1	N20 10.2
01	101 42.8	203 01.1	52.7	122 56.2	59.1	358 07.2	49.2	32 43.8	10.1
02	116 45.3	218 00.2	53.1	137 56.9	58.3	13 10.0	49.2	47 46.5	10.1
03	131 47.7	232 59.2 . .	53.4	152 57.7 . .	57.6	28 12.8 . .	49.3	62 49.2 . .	10.1
04	146 50.2	247 58.3	53.8	167 58.5	56.9	43 15.6	49.3	77 51.8	10.1
05	161 52.7	262 57.4	54.1	182 59.2	56.2	58 18.4	49.3	92 54.5	10.1
06	176 55.1	277 56.4	S22 54.5	198 00.0	S 9 55.4	73 21.2	N22 49.4	107 57.2	N20 10.0
07	191 57.6	292 55.5	54.8	213 00.7	54.7	88 24.0	49.4	122 59.8	10.0
M 08	207 00.1	307 54.6	55.1	228 01.5	54.0	103 26.8	49.5	138 02.5	10.0
A 09	222 02.5	322 53.6 . .	55.5	243 02.3 . .	53.2	118 29.6 . .	49.5	153 05.2 . .	10.0
R 10	237 05.0	337 52.7	55.8	258 03.0	52.5	133 32.4	49.5	168 07.8	09.9
11	252 07.5	352 51.8	56.1	273 03.8	51.8	148 35.2	49.6	183 10.5	09.9
T 12	267 09.9	7 50.8	S22 56.5	288 04.6	S 9 51.1	163 38.1	N22 49.6	198 13.2	N20 09.9
13	282 12.4	22 49.9	56.8	303 05.3	50.3	178 40.9	49.6	213 15.8	09.9
E 14	297 14.9	37 49.0	57.1	318 06.1	49.6	193 43.7	49.7	228 18.5	09.9
S 15	312 17.3	52 48.0 . .	57.5	333 06.8 . .	48.9	208 46.5 . .	49.7	243 21.2 . .	09.8
16	327 19.8	67 47.1	57.8	348 07.6	48.1	223 49.3	49.7	258 23.8	09.8
17	342 22.2	82 46.1	58.1	3 08.4	47.4	238 52.1	49.8	273 26.5	09.8
18	357 24.7	97 45.2	S22 58.4	18 09.1	S 9 46.7	253 54.9	N22 49.8	288 29.2	N20 09.8
19	12 27.2	112 44.3	58.8	33 09.9	46.0	268 57.7	49.8	303 31.8	09.8
20	27 29.6	127 43.3	59.1	48 10.6	45.2	284 00.5	49.9	318 34.5	09.7
21	42 32.1	142 42.4 . .	59.4	63 11.4 . .	44.5	299 03.3 . .	49.9	333 37.2 . .	09.7
22	57 34.6	157 41.5	22 59.7	78 12.2	43.8	314 06.1	49.9	348 39.8	09.7
23	72 37.0	172 40.5	23 00.1	93 12.9	43.0	329 08.9	50.0	3 42.5	09.7
19 00	87 39.5	187 39.6	S23 00.4	108 13.7	S 9 42.3	344 11.7	N22 50.0	18 45.2	N20 09.6
01	102 42.0	202 38.6	00.7	123 14.5	41.6	359 14.5	50.1	33 47.8	09.6
02	117 44.4	217 37.7	01.0	138 15.2	40.8	14 17.3	50.1	48 50.5	09.6
03	132 46.9	232 36.8 . .	01.3	153 16.0 . .	40.1	29 20.1 . .	50.1	63 53.2 . .	09.6
04	147 49.4	247 35.8	01.6	168 16.8	39.4	44 22.9	50.2	78 55.8	09.6
05	162 51.8	262 34.9	01.9	183 17.5	38.7	59 25.8	50.2	93 58.5	09.5
06	177 54.3	277 33.9	S23 02.3	198 18.3	S 9 37.9	74 28.6	N22 50.2	109 01.2	N20 09.5
M 07	192 56.7	292 33.0	02.6	213 19.0	37.2	89 31.4	50.3	124 03.8	09.5
I 08	207 59.2	307 32.1	02.9	228 19.8	36.5	104 34.2	50.3	139 06.5	09.5
E 09	223 01.7	322 31.1 . .	03.2	243 20.6 . .	35.7	119 37.0 . .	50.3	154 09.2 . .	09.5
R 10	238 04.1	337 30.2	03.5	258 21.3	35.0	134 39.8	50.4	169 11.8	09.4
C 11	253 06.6	352 29.2	03.8	273 22.1	34.3	149 42.6	50.4	184 14.5	09.4
O 12	268 09.1	7 28.3	S23 04.1	288 22.9	S 9 33.5	164 45.4	N22 50.4	199 17.2	N20 09.4
L 13	283 11.5	22 27.4	04.4	303 23.6	32.8	179 48.2	50.5	214 19.8	09.4
E 14	298 14.0	37 26.4	04.7	318 24.4	32.1	194 51.0	50.5	229 22.5	09.4
S 15	313 16.5	52 25.5 . .	05.0	333 25.1 . .	31.3	209 53.8 . .	50.5	244 25.2 . .	09.3
16	328 18.9	67 24.5	05.3	348 25.9	30.6	224 56.6	50.6	259 27.8	09.3
17	343 21.4	82 23.6	05.6	3 26.7	29.9	239 59.4	50.6	274 30.5	09.3
18	358 23.8	97 22.6	S23 05.9	18 27.4	S 9 29.1	255 02.3	N22 50.7	289 33.2	N20 09.3
19	13 26.3	112 21.7	06.2	33 28.2	28.4	270 05.1	50.7	304 35.8	09.2
20	28 28.8	127 20.8	06.5	48 29.0	27.7	285 07.9	50.7	319 38.5	09.2
21	43 31.2	142 19.8 . .	06.8	63 29.7 . .	26.9	300 10.7 . .	50.8	334 41.2 . .	09.2
22	58 33.7	157 18.9	07.1	78 30.5	26.2	315 13.5	50.8	349 43.8	09.2
23	73 36.2	172 17.9	07.4	93 31.3	25.5	330 16.3	50.8	4 46.5	09.2
20 00	88 38.6	187 17.0	S23 07.7	108 32.0	S 9 24.7	345 19.1	N22 50.9	19 49.2	N20 09.1
01	103 41.1	202 16.0	07.9	123 32.8	24.0	0 21.9	50.9	34 51.8	09.1
02	118 43.6	217 15.1	08.2	138 33.6	23.3	15 24.7	50.9	49 54.5	09.1
03	133 46.0	232 14.1 . .	08.5	153 34.3 . .	22.5	30 27.5 . .	51.0	64 57.1 . .	09.1
04	148 48.5	247 13.2	08.8	168 35.1	21.8	45 30.4	51.0	79 59.8	09.1
05	163 51.0	262 12.3	09.1	183 35.9	21.1	60 33.2	51.0	95 02.5	09.0
06	178 53.4	277 11.3	S23 09.4	198 36.6	S 9 20.3	75 36.0	N22 51.1	110 05.1	N20 09.0
07	193 55.9	292 10.4	09.6	213 37.4	19.6	90 38.8	51.1	125 07.8	09.0
J 08	208 58.3	307 09.4	09.9	228 38.2	18.9	105 41.6	51.1	140 10.5	09.0
U 09	224 00.8	322 08.5 . .	10.2	243 38.9 . .	18.1	120 44.4 . .	51.2	155 13.1 . .	09.0
E 10	239 03.3	337 07.5	10.5	258 39.7	17.4	135 47.2	51.2	170 15.8	08.9
V 11	254 05.7	352 06.6	10.8	273 40.4	16.7	150 50.0	51.2	185 18.5	08.9
12	269 08.2	7 05.6	S23 11.0	288 41.2	S 9 15.9	165 52.8	N22 51.3	200 21.1	N20 08.9
E 13	284 10.7	22 04.7	11.3	303 42.0	15.2	180 55.7	51.3	215 23.8	08.9
14	299 13.1	37 03.7	11.6	318 42.7	14.5	195 58.5	51.4	230 26.5	08.8
S 15	314 15.6	52 02.8 . .	11.8	333 43.5 . .	13.7	211 01.3 . .	51.4	245 29.1 . .	08.8
16	329 18.1	67 01.8	12.1	348 44.3	13.0	226 04.1	51.4	260 31.8	08.8
17	344 20.5	82 00.9	12.4	3 45.0	12.3	241 06.9	51.5	275 34.4	08.8
18	359 23.0	96 59.9	S23 12.6	18 45.8	S 9 11.5	256 09.7	N22 51.5	290 37.1	N20 08.8
19	14 25.5	111 59.0	12.9	33 46.6	10.8	271 12.5	51.5	305 39.8	08.7
20	29 27.9	126 58.0	13.2	48 47.3	10.0	286 15.3	51.6	320 42.4	08.7
21	44 30.4	141 57.1 . .	13.4	63 48.1 . .	09.3	301 18.1 . .	51.6	335 45.1 . .	08.7
22	59 32.8	156 56.1	13.7	78 48.9	08.6	316 21.0	51.6	350 47.8	08.7
23	74 35.3	171 55.2	14.0	93 49.6	07.8	331 23.8	51.7	5 50.4	08.7
	h m								
Pas. Mer.	18 06.4	v −0.9	d 0.3	v 0.8	d 0.7	v 2.8	d 0.0	v 2.7	d 0.0

ESTRELLAS

Nombre	A.H.S.	Dec.
	° ′	° ′
Acamar	315 24.8	S40 18.0
Achernar	335 33.1	S57 14.0
Acrux	173 19.7	S63 06.2
Adhara	255 19.3	S28 58.4
Aldebaran	290 59.4	N16 30.8
Alioth	166 28.7	N55 56.8
Alkaid	153 06.2	N49 18.1
Al Na'ir	27 55.2	S46 57.4
Alnilam	275 55.2	S 1 12.1
Alphard	218 04.8	S 8 39.9
Alphecca	126 19.0	N26 42.5
Alpheratz	357 52.9	N29 06.1
Altair	62 17.4	N 8 52.4
Ankaa	353 24.5	S42 18.1
Antares	112 37.8	S26 26.1
Arcturus	146 04.2	N19 10.3
Atria	107 48.4	S69 01.7
Avior	234 21.3	S59 30.7
Bellatrix	278 41.4	N 6 21.1
Betelgeuse	271 10.8	N 7 24.4
Canopus	263 59.6	S52 41.8
Capella	280 47.4	N46 00.0
Deneb	49 38.1	N45 17.3
Denebola	182 42.9	N14 33.7
Diphda	349 04.9	S17 58.8
Dubhe	194 02.4	N61 44.2
Elnath	278 23.7	N28 36.5
Eltanin	90 50.9	N51 29.3
Enif	33 56.2	N 9 53.0
Fomalhaut	15 34.0	S29 37.0
Gacrux	172 11.3	S57 07.0
Gienah	176 01.7	S17 32.9
Hadar	149 01.3	S60 22.6
Hamal	328 10.8	N23 28.3
Kaus Aust.	83 56.2	S34 23.0
Kochab	137 20.4	N74 08.7
Markab	13 47.4	N15 12.9
Menkar	314 24.3	N 4 05.8
Menkent	148 18.6	S36 22.5
Miaplacidus	221 41.1	S69 43.2
Mirfak	308 53.0	N49 52.2
Nunki	76 09.9	S26 17.7
Peacock	53 33.9	S56 44.0
Pollux	243 38.4	N28 01.3
Procyon	245 08.9	N 5 13.2
Rasalhague	96 15.2	N12 33.5
Regulus	207 53.0	N11 57.5
Rigel	281 20.4	S 8 12.0
Rigil Kent.	140 04.8	S60 50.2
Sabik	102 23.3	S15 43.6
Schedar	349 50.9	N56 33.1
Shaula	96 34.6	S37 06.3
Sirius	258 41.4	S16 43.1
Spica	158 41.0	S11 10.1
Suhail	222 58.8	S43 26.2
Vega	80 45.5	N38 47.2
Zuben'ubi	137 15.7	S16 02.8

	A.H.S.	Pas. Mer.
	° ′	h m
Venus	100 00.1	11 30
Marte	20 34.2	16 46
Júpiter	256 32.2	1 03
Saturno	291 05.7	22 41

(MAR., MIE., JUE.) 18, 19, 20 DICIEMBRE DEL 2001

T.U.	SOL			LUNA					
	A.H.G.		Dec.	A.H.G.	v	Dec.	d	P.H.	
d h	° ′		° ′	° ′	′	° ′	′	′	
MARTES 18 00	180 53.6		S23 22.9	140 54.9	10.6	S22 33.0	5.0	55.1	
01	195 53.3		23.0	155 24.5	10.6	22 28.0	5.0	55.1	
02	210 53.0		23.1	169 54.1	10.7	22 23.0	5.2	55.1	
03	225 52.7	. .	23.2	184 23.8	10.8	22 17.8	5.3	55.1	
04	240 52.4		23.2	198 53.6	10.8	22 12.5	5.4	55.1	
05	255 52.1		23.3	213 23.4	10.9	22 07.1	5.5	55.0	
06	270 51.8		S23 23.4	227 53.3	11.0	S22 01.6	5.5	55.0	
07	285 51.5		23.4	242 23.3	11.1	21 56.1	5.7	55.0	
08	300 51.2		23.5	256 53.4	11.1	21 50.4	5.8	55.0	
09	315 50.9	. .	23.6	271 23.5	11.2	21 44.6	5.9	55.0	
10	330 50.5		23.6	285 53.7	11.2	21 38.7	6.0	55.0	
11	345 50.2		23.7	300 23.9	11.4	21 32.7	6.1	54.9	
12	0 49.9		S23 23.8	314 54.3	11.4	S21 26.6	6.2	54.9	
13	15 49.6		23.8	329 24.7	11.4	21 20.4	6.2	54.9	
14	30 49.3		23.9	343 55.1	11.5	21 14.2	6.4	54.9	
15	45 49.0	. .	24.0	358 25.6	11.7	21 07.8	6.5	54.9	
16	60 48.7		24.0	12 56.3	11.6	21 01.3	6.5	54.8	
17	75 48.4		24.1	27 26.9	11.8	20 54.8	6.7	54.8	
18	90 48.1		S23 24.1	41 57.7	11.8	S20 48.1	6.8	54.8	
19	105 47.8		24.2	56 28.5	11.9	20 41.3	6.8	54.8	
20	120 47.5		24.3	70 59.4	11.9	20 34.5	6.9	54.8	
21	135 47.1	. .	24.3	85 30.3	12.0	20 27.6	7.0	54.8	
22	150 46.8		24.4	100 01.3	12.1	20 20.6	7.2	54.7	
23	165 46.5		24.4	114 32.4	12.2	20 13.4	7.1	54.7	
MIERCOLES 19 00	180 46.2		S23 24.5	129 03.6	12.2	S20 06.3	7.3	54.7	
01	195 45.9		24.5	143 34.8	12.3	19 59.0	7.4	54.7	
02	210 45.6		24.6	158 06.1	12.4	19 51.6	7.5	54.7	
03	225 45.3	. .	24.7	172 37.5	12.4	19 44.1	7.5	54.7	
04	240 45.0		24.7	187 08.9	12.5	19 36.6	7.6	54.6	
05	255 44.7		24.8	201 40.4	12.6	19 29.0	7.7	54.6	
06	270 44.4		S23 24.8	216 12.0	12.7	S19 21.3	7.8	54.6	
07	285 44.1		24.9	230 43.7	12.7	19 13.5	7.9	54.6	
08	300 43.7		24.9	245 15.4	12.8	19 05.6	7.9	54.6	
09	315 43.4	. .	25.0	259 47.2	12.8	18 57.7	8.1	54.6	
10	330 43.1		25.0	274 19.0	12.9	18 49.6	8.1	54.6	
11	345 42.8		25.0	288 50.9	13.0	18 41.5	8.1	54.5	
12	0 42.5		S23 25.1	303 22.9	13.0	S18 33.4	8.3	54.5	
13	15 42.2		25.1	317 54.9	13.2	18 25.1	8.3	54.5	
14	30 41.9		25.2	332 27.1	13.1	18 16.8	8.4	54.5	
15	45 41.6	. .	25.2	346 59.2	13.3	18 08.4	8.5	54.5	
16	60 41.3		25.3	1 31.5	13.3	17 59.9	8.6	54.5	
17	75 41.0		25.3	16 03.8	13.4	17 51.3	8.6	54.5	
18	90 40.6		S23 25.4	30 36.2	13.4	S17 42.7	8.7	54.5	
19	105 40.3		25.4	45 08.6	13.5	17 34.0	8.8	54.4	
20	120 40.0		25.4	59 41.1	13.6	17 25.2	8.8	54.4	
21	135 39.7	. .	25.5	74 13.7	13.6	17 16.4	8.9	54.4	
22	150 39.4		25.5	88 46.3	13.7	17 07.5	9.0	54.4	
23	165 39.1		25.5	103 19.0	13.7	16 58.5	9.1	54.4	
JUEVES 20 00	180 38.8		S23 25.6	117 51.7	13.9	S16 49.4	9.1	54.4	
01	195 38.5		25.6	132 24.6	13.8	16 40.3	9.2	54.4	
02	210 38.2		25.6	146 57.4	14.0	16 31.1	9.2	54.4	
03	225 37.9	. .	25.7	161 30.4	14.0	16 21.9	9.3	54.4	
04	240 37.5		25.7	176 03.4	14.0	16 12.6	9.4	54.3	
05	255 37.2		25.7	190 36.4	14.1	16 03.2	9.4	54.3	
06	270 36.9		S23 25.8	205 09.5	14.2	S15 53.8	9.5	54.3	
07	285 36.6		25.8	219 42.7	14.2	15 44.3	9.6	54.3	
08	300 36.3		25.8	234 15.9	14.3	15 34.7	9.6	54.3	
09	315 36.0	. .	25.9	248 49.2	14.3	15 25.1	9.7	54.3	
10	330 35.7		25.9	263 22.5	14.4	15 15.4	9.7	54.3	
11	345 35.4		25.9	277 55.9	14.5	15 05.7	9.8	54.3	
12	0 35.1		S23 25.9	292 29.4	14.5	S14 55.9	9.9	54.3	
13	15 34.8		26.0	307 02.9	14.6	14 46.0	9.9	54.3	
14	30 34.4		26.0	321 36.5	14.6	14 36.1	9.9	54.3	
15	45 34.1	. .	26.0	336 10.1	14.6	14 26.2	10.1	54.3	
16	60 33.8		26.0	350 43.7	14.7	14 16.1	10.0	54.3	
17	75 33.5		26.1	5 17.4	14.8	14 06.1	10.2	54.2	
18	90 33.2		S23 26.1	19 51.2	14.8	S13 55.9	10.2	54.2	
19	105 32.9		26.1	34 25.0	14.9	13 45.7	10.2	54.2	
20	120 32.6		26.1	48 58.9	14.9	13 35.5	10.3	54.2	
21	135 32.3	. .	26.1	63 32.8	14.9	13 25.2	10.3	54.2	
22	150 32.0		26.2	78 06.7	15.1	13 14.9	10.4	54.2	
23	165 31.6		26.2	92 40.8	15.0	S13 04.5	10.4	54.2	
	SD 16.3		d 0.0	SD	15.0	14.9		14.8	

Lat.	Crepúsculo Náutico	Crepúsculo Civil	Orto Sol	Orto Luna 18	Orto Luna 19	Orto Luna 20	Orto Luna 21
°	h m	h m	h m	h m	h m	h m	h m
N 72	08 24	10 56	▬	▬	▬	14 09	13 34
N 70	08 04	09 53	▬	▬	14 13	13 38	13 18
68	07 48	09 18	▬	14 05	13 32	13 16	13 04
66	07 35	08 52	10 33	13 10	13 03	12 58	12 53
64	07 24	08 33	09 51	12 37	12 42	12 44	12 44
62	07 15	08 17	09 22	12 12	12 24	12 32	12 36
60	07 06	08 03	09 01	11 53	12 10	12 21	12 29
N 58	06 59	07 51	08 43	11 37	11 57	12 12	12 23
56	06 52	07 41	08 29	11 23	11 46	12 04	12 18
54	06 46	07 32	08 16	11 11	11 37	11 57	12 13
52	06 40	07 24	08 05	11 01	11 28	11 50	12 09
50	06 35	07 16	07 55	10 51	11 21	11 45	12 05
45	06 23	07 00	07 34	10 31	11 04	11 32	11 56
N 40	06 13	06 47	07 17	10 15	10 51	11 22	11 49
35	06 03	06 35	07 03	10 02	10 39	11 13	11 42
30	05 54	06 24	06 51	09 50	10 29	11 05	11 37
20	05 38	06 05	06 29	09 29	10 12	10 51	11 27
N 10	05 22	05 48	06 11	09 11	09 57	10 39	11 19
0	05 05	05 31	05 53	08 55	09 43	10 28	11 11
S 10	04 46	05 13	05 36	08 38	09 28	10 16	11 02
20	04 23	04 52	05 17	08 20	09 13	10 04	10 54
30	03 54	04 27	04 55	07 59	08 55	09 50	10 44
35	03 35	04 12	04 42	07 47	08 45	09 42	10 38
40	03 12	03 54	04 27	07 33	08 33	09 33	10 32
45	02 41	03 31	04 09	07 17	08 19	09 22	10 24
S 50	01 56	03 01	03 46	06 56	08 02	09 09	10 15
52	01 28	02 46	03 35	06 47	07 54	09 03	10 11
54	00 41	02 28	03 23	06 36	07 45	08 56	10 06
56	////	02 06	03 09	06 23	07 35	08 48	10 01
58	////	01 36	02 52	06 09	07 24	08 40	09 55
S 60	////	00 45	02 31	05 51	07 10	08 30	09 49

Lat.	Ocaso Sol	Crepúsculo Civil	Crepúsculo Náutico	Ocaso Luna 18	Ocaso Luna 19	Ocaso Luna 20	Ocaso Luna 21
°	h m	h m	h m	h m	h m	h m	h m
N 72	▬	12 59	15 30	▬	▬	19 27	21 30
N 70	▬	14 01	15 50	▬	17 49	19 56	21 44
68	▬	14 37	16 06	16 18	18 29	20 17	21 56
66	13 21	15 02	16 19	17 13	18 57	20 33	22 06
64	14 04	15 22	16 30	17 45	19 17	20 47	22 13
62	14 32	15 38	16 40	18 09	19 34	20 58	22 20
60	14 53	15 51	16 48	18 28	19 48	21 08	22 26
N 58	15 11	16 03	16 56	18 44	20 00	21 16	22 31
56	15 26	16 13	17 02	18 57	20 10	21 23	22 36
54	15 38	16 22	17 09	19 08	20 19	21 30	22 40
52	15 50	16 31	17 14	19 19	20 27	21 36	22 44
50	15 59	16 38	17 20	19 28	20 34	21 41	22 47
45	16 20	16 54	17 31	19 47	20 50	21 52	22 54
N 40	16 37	17 08	17 42	20 02	21 02	22 02	23 00
35	16 51	17 19	17 51	20 15	21 13	22 09	23 05
30	17 04	17 30	18 00	20 26	21 22	22 16	23 10
20	17 25	17 49	18 16	20 46	21 38	22 28	23 17
N 10	17 43	18 06	18 33	21 03	21 52	22 39	23 24
0	18 01	18 23	18 50	21 18	22 05	22 49	23 31
S 10	18 19	18 42	19 09	21 34	22 17	22 58	23 37
20	18 38	19 02	19 31	21 50	22 31	23 08	23 43
30	19 00	19 27	20 00	22 09	22 47	23 20	23 51
35	19 13	19 42	20 19	22 20	22 56	23 27	23 55
40	19 28	20 01	20 42	22 33	23 06	23 34	24 00
45	19 46	20 23	21 13	22 47	23 18	23 43	24 06
S 50	20 08	20 53	21 59	23 05	23 32	23 54	24 12
52	20 19	21 08	22 27	23 14	23 39	23 59	24 15
54	20 32	21 26	23 14	23 23	23 46	24 04	00 04
56	20 46	21 48	////	23 34	23 54	24 10	00 10
58	21 03	22 18	////	23 46	24 04	00 04	00 16
S 60	21 23	23 10	////	24 00	00 00	00 14	00 24

Día	SOL E. T. (+) 00h	SOL E. T. (+) 12h	SOL Pas. Mer.	LUNA Pas. Mer. Sup.	LUNA Pas. Mer. Inf.	LUNA Edad	LUNA Fase
d	m s	m s	h m	h m	h m	d	%
18	03 35	03 20	11 57	15 07	02 42	04	13
19	03 06	02 51	11 57	15 54	03 30	05	20
20	02 36	02 21	11 58	16 38	04 16	06	28

(VIE., SAB., DOM.) 21, 22, 23 DICIEMBRE DEL 2001

T.U.	ARIES	VENUS −3.9		MARTE +0.7		JUPITER −2.7		SATURNO −0.3	
	A.H.G.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
21 00	89 37.8	186 54.2	S23 14.2	108 50.4	S 9 07.1	346 26.6	N22 51.7	20 53.1	N20 08.6
01	104 40.2	201 53.3	14.5	123 51.2	06.4	1 29.4	51.7	35 55.8	08.6
02	119 42.7	216 52.3	14.7	138 51.9	05.6	16 32.2	51.8	50 58.4	08.6
03	134 45.2	231 51.4	15.0	153 52.7	04.9	31 35.0	51.8	66 01.1	08.6
04	149 47.6	246 50.4	15.3	168 53.5	04.2	46 37.8	51.8	81 03.7	08.6
05	164 50.1	261 49.5	15.5	183 54.2	03.4	61 40.7	51.9	96 06.4	08.5
06	179 52.6	276 48.5	S23 15.8	198 55.0	S 9 02.7	76 43.5	N22 51.9	111 09.1	N20 08.5
07	194 55.0	291 47.6	16.0	213 55.8	01.9	91 46.3	52.0	126 11.7	08.5
08	209 57.5	306 46.6	16.3	228 56.6	01.2	106 49.1	52.0	141 14.4	08.5
V 09	225 00.0	321 45.7	16.5	243 57.3	9 00.5	121 51.9	52.0	156 17.0	08.5
I 10	240 02.4	336 44.7	16.8	258 58.1	8 59.7	136 54.7	52.1	171 19.7	08.4
E 11	255 04.9	351 43.8	17.0	273 58.9	59.0	151 57.5	52.1	186 22.4	08.4
R 12	270 07.3	6 42.8	S23 17.2	288 59.6	S 8 58.3	167 00.4	N22 52.1	201 25.0	N20 08.4
N 13	285 09.8	21 41.9	17.5	304 00.4	57.5	182 03.2	52.2	216 27.7	08.4
E 14	300 12.3	36 40.9	17.7	319 01.2	56.8	197 06.0	52.2	231 30.4	08.4
S 15	315 14.7	51 40.0	18.0	334 01.9	56.0	212 08.8	52.2	246 33.0	08.3
16	330 17.2	66 39.0	18.2	349 02.7	55.3	227 11.6	52.3	261 35.7	08.3
17	345 19.7	81 38.1	18.4	4 03.5	54.6	242 14.4	52.3	276 38.3	08.3
18	0 22.1	96 37.1	S23 18.7	19 04.2	S 8 53.8	257 17.2	N22 52.3	291 41.0	N20 08.3
19	15 24.6	111 36.1	18.9	34 05.0	53.1	272 20.1	52.4	306 43.7	08.3
20	30 27.1	126 35.2	19.2	49 05.8	52.4	287 22.9	52.4	321 46.3	08.2
21	45 29.5	141 34.2	19.4	64 06.5	51.6	302 25.7	52.4	336 49.0	08.2
22	60 32.0	156 33.3	19.6	79 07.3	50.9	317 28.5	52.5	351 51.6	08.2
23	75 34.4	171 32.3	19.9	94 08.1	50.1	332 31.3	52.5	6 54.3	08.2
22 00	90 36.9	186 31.4	S23 20.1	109 08.8	S 8 49.4	347 34.1	N22 52.6	21 57.0	N20 08.2
01	105 39.4	201 30.4	20.3	124 09.6	48.7	2 37.0	52.6	36 59.6	08.1
02	120 41.8	216 29.5	20.5	139 10.4	47.9	17 39.8	52.6	52 02.3	08.1
03	135 44.3	231 28.5	20.8	154 11.2	47.2	32 42.6	52.7	67 04.9	08.1
04	150 46.8	246 27.5	21.0	169 11.9	46.4	47 45.4	52.7	82 07.6	08.1
05	165 49.2	261 26.6	21.2	184 12.7	45.7	62 48.2	52.7	97 10.3	08.1
06	180 51.7	276 25.6	S23 21.4	199 13.5	S 8 45.0	77 51.0	N22 52.8	112 12.9	N20 08.0
07	195 54.2	291 24.7	21.7	214 14.2	44.2	92 53.8	52.8	127 15.6	08.0
S 08	210 56.6	306 23.7	21.9	229 15.0	43.5	107 56.7	52.8	142 18.2	08.0
A 09	225 59.1	321 22.8	22.1	244 15.8	42.8	122 59.5	52.9	157 20.9	08.0
B 10	241 01.6	336 21.8	22.3	259 16.5	42.0	138 02.3	52.9	172 23.6	08.0
A 11	256 04.0	351 20.8	22.5	274 17.3	41.3	153 05.1	52.9	187 26.2	07.9
D 12	271 06.5	6 19.9	S23 22.7	289 18.1	S 8 40.5	168 07.9	N22 53.0	202 28.9	N20 07.9
O 13	286 08.9	21 18.9	23.0	304 18.9	39.8	183 10.8	53.0	217 31.5	07.9
14	301 11.4	36 18.0	23.2	319 19.6	39.1	198 13.6	53.0	232 34.2	07.9
15	316 13.9	51 17.0	23.4	334 20.4	38.3	213 16.4	53.1	247 36.9	07.9
16	331 16.3	66 16.1	23.6	349 21.2	37.6	228 19.2	53.1	262 39.5	07.8
17	346 18.8	81 15.1	23.8	4 21.9	36.8	243 22.0	53.1	277 42.2	07.8
18	1 21.3	96 14.1	S23 24.0	19 22.7	S 8 36.1	258 24.8	N22 53.2	292 44.8	N20 07.8
19	16 23.7	111 13.2	24.2	34 23.5	35.3	273 27.7	53.2	307 47.5	07.8
20	31 26.2	126 12.2	24.4	49 24.3	34.6	288 30.5	53.3	322 50.2	07.8
21	46 28.7	141 11.3	24.6	64 25.0	33.9	303 33.3	53.3	337 52.8	07.7
22	61 31.1	156 10.3	24.8	79 25.8	33.1	318 36.1	53.3	352 55.5	07.7
23	76 33.6	171 09.3	25.0	94 26.6	32.4	333 38.9	53.4	7 58.1	07.7
23 00	91 36.0	186 08.4	S23 25.2	109 27.3	S 8 31.6	348 41.8	N22 53.4	23 00.8	N20 07.7
01	106 38.5	201 07.4	25.4	124 28.1	30.9	3 44.6	53.4	38 03.5	07.7
02	121 41.0	216 06.5	25.6	139 28.9	30.2	18 47.4	53.5	53 06.1	07.6
03	136 43.4	231 05.5	25.8	154 29.7	29.4	33 50.2	53.5	68 08.8	07.6
04	151 45.9	246 04.5	26.0	169 30.4	28.7	48 53.0	53.5	83 11.4	07.6
05	166 48.4	261 03.6	26.2	184 31.2	27.9	63 55.8	53.6	98 14.1	07.6
06	181 50.8	276 02.6	S23 26.4	199 32.0	S 8 27.2	78 58.7	N22 53.6	113 16.7	N20 07.6
07	196 53.3	291 01.7	26.6	214 32.7	26.5	94 01.5	53.6	128 19.4	07.5
D 08	211 55.8	306 00.7	26.8	229 33.5	25.7	109 04.3	53.7	143 22.1	07.5
O 09	226 58.2	320 59.7	27.0	244 34.3	25.0	124 07.1	53.7	158 24.7	07.5
M 10	242 00.7	335 58.8	27.2	259 35.1	24.2	139 09.9	53.7	173 27.4	07.5
I 11	257 03.2	350 57.8	27.3	274 35.8	23.5	154 12.8	53.8	188 30.0	07.5
N 12	272 05.6	5 56.9	S23 27.5	289 36.6	S 8 22.7	169 15.6	N22 53.8	203 32.7	N20 07.4
G 13	287 08.1	20 55.9	27.7	304 37.4	22.0	184 18.4	53.8	218 35.3	07.4
O 14	302 10.5	35 54.9	27.9	319 38.1	21.3	199 21.2	53.9	233 38.0	07.4
15	317 13.0	50 54.0	28.1	334 38.9	20.5	214 24.0	53.9	248 40.7	07.4
16	332 15.5	65 53.0	28.3	349 39.7	19.8	229 26.9	54.0	263 43.3	07.4
17	347 17.9	80 52.1	28.4	4 40.5	19.0	244 29.7	54.0	278 46.0	07.3
18	2 20.4	95 51.1	S23 28.6	19 41.2	S 8 18.3	259 32.5	N22 54.0	293 48.6	N20 07.3
19	17 22.9	110 50.1	28.8	34 42.0	17.5	274 35.3	54.1	308 51.3	07.3
20	32 25.3	125 49.2	29.0	49 42.8	16.8	289 38.1	54.1	323 53.9	07.3
21	47 27.8	140 48.2	29.1	64 43.6	16.1	304 41.0	54.1	338 56.6	07.3
22	62 30.3	155 47.2	29.3	79 44.3	15.3	319 43.8	54.2	353 59.3	07.2
23	77 32.7	170 46.3	29.5	94 45.1	14.6	334 46.6	54.2	9 01.9	07.2
Pas. Mer.	h m 17 54.6	v −1.0	d 0.2	v 0.8	d 0.7	v 2.8	d 0.0	v 2.7	d 0.0

ESTRELLAS		
Nombre	A.H.S.	Dec.
	° ′	° ′
Acamar	315 24.8	S40 18.1
Achernar	335 33.1	S57 14.0
Acrux	173 19.7	S63 06.2
Adhara	255 19.3	S28 58.4
Aldebaran	290 59.4	N16 30.8
Alioth	166 28.6	N55 56.8
Alkaid	153 06.2	N49 18.1
Al Na'ir	27 55.2	S46 57.4
Alnilam	275 55.2	S 1 12.1
Alphard	218 04.8	S 8 39.9
Alphecca	126 19.0	N26 42.5
Alpheratz	357 52.9	N29 06.1
Altair	62 17.4	N 8 52.4
Ankaa	353 24.5	S42 18.1
Antares	112 37.7	S26 26.1
Arcturus	146 04.2	N19 10.3
Atria	107 48.3	S69 01.7
Avior	234 21.2	S59 30.7
Bellatrix	278 41.4	N 6 21.1
Betelgeuse	271 10.7	N 7 24.4
Canopus	263 59.6	S52 41.8
Capella	280 47.4	N46 00.0
Deneb	49 38.1	N45 17.3
Denebola	182 42.8	N14 33.7
Diphda	349 04.9	S17 58.8
Dubhe	194 02.4	N61 44.2
Elnath	278 23.7	N28 36.5
Eltanin	90 50.9	N51 29.3
Enif	33 56.2	N 9 53.0
Fomalhaut	15 34.0	S29 37.0
Gacrux	172 11.2	S57 07.1
Gienah	176 01.7	S17 33.0
Hadar	149 01.3	S60 22.6
Hamal	328 10.8	N23 28.3
Kaus Aust.	83 56.2	S34 23.0
Kochab	137 20.3	N74 08.7
Markab	13 47.5	N15 12.9
Menkar	314 24.3	N 4 05.8
Menkent	148 18.5	S36 22.5
Miaplacidus	221 41.1	S69 43.2
Mirfak	308 53.0	N49 52.2
Nunki	76 09.9	S26 17.7
Peacock	53 33.9	S56 44.0
Pollux	243 38.4	N28 01.3
Procyon	245 08.9	N 5 13.2
Rasalhague	96 15.2	N12 33.5
Regulus	207 52.9	N11 57.5
Rigel	281 20.4	S 8 12.0
Rigil Kent.	140 04.8	S60 50.2
Sabik	102 23.3	S15 43.6
Schedar	349 50.9	N56 33.1
Shaula	96 34.6	S37 06.3
Sirius	258 41.4	S16 43.1
Spica	158 40.9	S11 10.1
Suhail	222 58.8	S43 26.2
Vega	80 45.5	N38 47.1
Zuben'ubi	137 15.7	S16 02.8

	A.H.S.	Pas. Mer.
	° ′	h m
Venus	95 54.5	11 35
Marte	18 31.9	16 43
Júpiter	256 57.2	0 50
Saturno	291 20.1	22 28

T.U.	SOL				LUNA					
	A.H.G.		Dec.		A.H.G.	v	Dec.		d	P.H.
d h	°	′	°	′	°	′	°	′	′	′
21 00	180	31.3	S23	26.2	107	14.8	15.1	S12	54.1	10.5	54.2
01	195	31.0		26.2	121	48.9	15.1	12	43.6	10.6	54.2
02	210	30.7		26.2	136	23.0	15.2	12	33.0	10.6	54.2
03	225	30.4	. .	26.2	150	57.2	15.3	12	22.4	10.6	54.2
04	240	30.1		26.3	165	31.5	15.2	12	11.8	10.7	54.2
05	255	29.8		26.3	180	05.7	15.3	12	01.1	10.7	54.2
06	270	29.5	S23	26.3	194	40.0	15.4	S11	50.4	10.8	54.2
07	285	29.2		26.3	209	14.4	15.4	11	39.6	10.8	54.2
V 08	300	28.8		26.3	223	48.8	15.4	11	28.8	10.8	54.2
I 09	315	28.5	. .	26.3	238	23.2	15.5	11	18.0	10.9	54.2
10	330	28.2		26.3	252	57.7	15.5	11	07.1	11.0	54.2
E 11	345	27.9		26.3	267	32.2	15.5	10	56.1	10.9	54.2
R 12	0	27.6	S23	26.3	282	06.7	15.6	S10	45.2	11.1	54.2
N 13	15	27.3		26.3	296	41.3	15.6	10	34.1	11.0	54.2
E 14	30	27.0		26.3	311	15.9	15.7	10	23.1	11.1	54.2
S 15	45	26.7	. .	26.3	325	50.6	15.7	10	12.0	11.2	54.2
16	60	26.4		26.3	340	25.3	15.7	10	00.8	11.1	54.2
17	75	26.1		26.3	355	00.0	15.7	9	49.7	11.3	54.2
18	90	25.7	S23	26.3	9	34.7	15.8	S 9	38.4	11.2	54.2
19	105	25.4		26.3	24	09.5	15.8	9	27.2	11.3	54.2
20	120	25.1		26.3	38	44.3	15.8	9	15.9	11.3	54.2
21	135	24.8	. .	26.3	53	19.1	15.9	9	04.6	11.4	54.2
22	150	24.5		26.3	67	54.0	15.9	8	53.2	11.4	54.2
23	165	24.2		26.3	82	28.9	15.9	8	41.8	11.4	54.2
22 00	180	23.9	S23	26.3	97	03.8	15.9	S 8	30.4	11.5	54.2
01	195	23.6		26.3	111	38.7	16.0	8	18.9	11.5	54.2
02	210	23.3		26.3	126	13.7	16.0	8	07.4	11.5	54.2
03	225	22.9	. .	26.3	140	48.7	16.0	7	55.9	11.6	54.2
04	240	22.6		26.3	155	23.7	16.0	7	44.3	11.5	54.2
05	255	22.3		26.3	169	58.7	16.0	7	32.8	11.7	54.2
06	270	22.0	S23	26.3	184	33.7	16.1	S 7	21.1	11.6	54.2
07	285	21.7		26.3	199	08.8	16.1	7	09.5	11.7	54.2
S 08	300	21.4		26.3	213	43.9	16.1	6	57.8	11.7	54.2
A 09	315	21.1	. .	26.3	228	19.0	16.1	6	46.1	11.7	54.3
B 10	330	20.8		26.3	242	54.1	16.1	6	34.4	11.8	54.3
11	345	20.5		26.3	257	29.2	16.2	6	22.6	11.8	54.3
A 12	0	20.1	S23	26.2	272	04.4	16.1	S 6	10.8	11.8	54.3
13	15	19.8		26.2	286	39.5	16.2	5	59.0	11.9	54.3
D 14	30	19.5		26.2	301	14.7	16.2	5	47.1	11.8	54.3
15	45	19.2	. .	26.2	315	49.9	16.2	5	35.3	11.9	54.3
O 16	60	18.9		26.2	330	25.1	16.2	5	23.4	11.9	54.3
17	75	18.6		26.2	345	00.3	16.2	5	11.5	12.0	54.3
18	90	18.3	S23	26.1	359	35.5	16.2	S 4	59.5	11.9	54.3
19	105	18.0		26.1	14	10.7	16.3	4	47.6	12.0	54.3
20	120	17.7		26.1	28	46.0	16.2	4	35.6	12.0	54.3
21	135	17.3	. .	26.1	43	21.2	16.3	4	23.6	12.0	54.3
22	150	17.0		26.1	57	56.5	16.2	4	11.6	12.1	54.4
23	165	16.7		26.0	72	31.7	16.2	3	59.5	12.0	54.4
23 00	180	16.4	S23	26.0	87	06.9	16.3	S 3	47.5	12.1	54.4
01	195	16.1		26.0	101	42.2	16.2	3	35.4	12.1	54.4
02	210	15.8		26.0	116	17.4	16.3	3	23.3	12.2	54.4
03	225	15.5	. .	25.9	130	52.7	16.2	3	11.1	12.1	54.4
04	240	15.2		25.9	145	27.9	16.3	2	59.0	12.1	54.4
05	255	14.9		25.9	160	03.2	16.2	2	46.9	12.2	54.4
06	270	14.5	S23	25.9	174	38.4	16.3	S 2	34.7	12.2	54.4
07	285	14.2		25.8	189	13.7	16.2	2	22.5	12.2	54.5
D 08	300	13.9		25.8	203	48.9	16.2	2	10.3	12.2	54.5
O 09	315	13.6	. .	25.8	218	24.1	16.2	1	58.1	12.2	54.5
M 10	330	13.3		25.7	232	59.3	16.3	1	45.9	12.3	54.5
I 11	345	13.0		25.7	247	34.6	16.2	1	33.6	12.2	54.5
N 12	0	12.7	S23	25.7	262	09.8	16.1	S 1	21.4	12.3	54.5
G 13	15	12.4		25.6	276	44.9	16.2	1	09.1	12.3	54.5
O 14	30	12.1		25.6	291	20.1	16.2	0	56.8	12.3	54.6
15	45	11.7	. .	25.6	305	55.3	16.1	0	44.5	12.3	54.6
16	60	11.4		25.5	320	30.4	16.2	0	32.2	12.3	54.6
17	75	11.1		25.5	335	05.6	16.1	0	19.9	12.3	54.6
18	90	10.8	S23	25.5	349	40.7	16.1	S 0	07.6	12.3	54.6
19	105	10.5		25.4	4	15.8	16.1	N 0	04.7	12.3	54.6
20	120	10.2		25.4	18	50.9	16.1	0	17.0	12.4	54.7
21	135	09.9	. .	25.3	33	26.0	16.0	0	29.4	12.3	54.7
22	150	09.6		25.3	48	01.0	16.1	0	41.7	12.4	54.7
23	165	09.3		25.3	62	36.1	16.0	N 0	54.1	12.3	54.7
	SD	16.3	d	0.0	SD		14.8		14.8		14.9

Lat.	Crepúsculo Náutico	Crepúsculo Civil	Orto Sol	Orto Luna 21	Orto Luna 22	Orto Luna 23	Orto Luna 24
°	h m	h m	h m	h m	h m	h m	h m
N 72	08 26	10 58	▬	13 34	13 10	12 49	12 28
N 70	08 06	09 55	▬	13 18	13 01	12 47	12 33
68	07 50	09 20	▬	13 04	12 55	12 46	12 37
66	07 37	08 54	10 35	12 53	12 49	12 44	12 40
64	07 26	08 34	09 53	12 44	12 44	12 43	12 43
62	07 16	08 18	09 24	12 36	12 40	12 42	12 45
60	07 08	08 05	09 03	12 29	12 36	12 42	12 48
N 58	07 00	07 53	08 45	12 23	12 33	12 41	12 49
56	06 53	07 43	08 30	12 18	12 30	12 40	12 51
54	06 47	07 34	08 17	12 13	12 27	12 40	12 53
52	06 42	07 25	08 06	12 09	12 24	12 39	12 54
50	06 36	07 18	07 56	12 05	12 22	12 39	12 56
45	06 24	07 02	07 36	11 56	12 17	12 38	12 58
N 40	06 14	06 48	07 19	11 49	12 13	12 37	13 01
35	06 05	06 36	07 05	11 42	12 10	12 36	13 03
30	05 56	06 26	06 52	11 37	12 07	12 36	13 05
20	05 39	06 07	06 31	11 27	12 01	12 35	13 08
N 10	05 23	05 50	06 12	11 19	11 56	12 34	13 11
0	05 06	05 32	05 55	11 11	11 52	12 33	13 14
S 10	04 47	05 14	05 37	11 02	11 47	12 32	13 17
20	04 24	04 54	05 18	10 54	11 42	12 31	13 20
30	03 55	04 29	04 56	10 44	11 37	12 30	13 23
35	03 37	04 13	04 43	10 38	11 34	12 29	13 25
40	03 13	03 55	04 28	10 32	11 30	12 28	13 27
45	02 43	03 33	04 10	10 24	11 26	12 28	13 30
S 50	01 57	03 03	03 47	10 15	11 21	12 27	13 33
52	01 29	02 48	03 36	10 11	11 19	12 26	13 35
54	00 42	02 30	03 24	10 06	11 16	12 26	13 36
56	////	02 07	03 10	10 01	11 13	12 25	13 38
58	////	01 37	02 53	09 55	11 10	12 25	13 40
S 60	////	00 46	02 32	09 49	11 06	12 24	13 42

Lat.	Ocaso Sol	Crepúsculo Civil	Crepúsculo Náutico	Ocaso Luna 21	Ocaso Luna 22	Ocaso Luna 23	Ocaso Luna 24
°	h m	h m	h m	h m	h m	h m	h m
N 72	▬	12 59	15 31	21 30	23 20	25 08	01 08
N 70	▬	14 02	15 51	21 44	23 26	25 07	01 07
68	▬	14 38	16 07	21 56	23 31	25 05	01 05
66	13 22	15 03	16 20	22 06	23 35	25 04	01 04
64	14 05	15 23	16 31	22 13	23 38	25 03	01 03
62	14 33	15 39	16 41	22 20	23 41	25 02	01 02
60	14 55	15 53	16 49	22 26	23 44	25 01	01 01
N 58	15 12	16 04	16 57	22 31	23 46	25 01	01 01
56	15 27	16 15	17 04	22 36	23 48	25 00	01 00
54	15 40	16 24	17 10	22 40	23 49	24 59	00 59
52	15 51	16 32	17 16	22 44	23 51	24 59	00 59
50	16 01	16 39	17 21	22 47	23 53	24 59	00 59
45	16 22	16 56	17 33	22 54	23 56	24 58	00 58
N 40	16 38	17 09	17 43	23 00	23 58	24 57	00 57
35	16 53	17 21	17 53	23 05	24 00	00 00	00 56
30	17 05	17 31	18 01	23 10	24 02	00 02	00 55
20	17 26	17 50	18 18	23 17	24 06	00 06	00 54
N 10	17 45	18 08	18 34	23 24	24 09	00 09	00 53
0	18 02	18 25	18 51	23 31	24 11	00 11	00 52
S 10	18 20	18 43	19 10	23 37	24 14	00 14	00 51
20	18 39	19 04	19 33	23 43	24 17	00 17	00 50
30	19 01	19 29	20 02	23 51	24 20	00 20	00 49
35	19 14	19 44	20 21	23 55	24 22	00 22	00 49
40	19 29	20 02	20 44	24 00	00 00	00 24	00 48
45	19 47	20 25	21 15	24 06	00 06	00 27	00 47
S 50	20 10	20 55	22 00	24 12	00 12	00 29	00 46
52	20 21	21 10	22 28	24 15	00 15	00 31	00 45
54	20 33	21 28	23 15	00 04	00 19	00 32	00 45
56	20 47	21 50	////	00 10	00 23	00 34	00 44
58	21 04	22 20	////	00 16	00 27	00 35	00 44
S 60	21 25	23 11	////	00 24	00 31	00 37	00 43

Día	SOL E. T. (+) 00h	SOL E. T. (+) 12h	SOL Pas. Mer.	LUNA Pas. Sup.	LUNA Mer. Inf.	LUNA Edad	LUNA Fase
d	m s	m s	h m	h m	h m	d	%
21	02 06	01 51	11 58	17 21	05 00	07	37
22	01 36	01 21	11 59	18 02	05 41	08	47
23	01 06	00 51	11 59	18 42	06 22	09	56

(LUN., MAR., MIE.) 24, 25, 26 DICIEMBRE DEL 2001

T.U.	ARIES	VENUS −3.9		MARTE +0.7		JUPITER −2.7		SATURNO −0.3	
	A.H.G.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
24 00	92 35.2	185 45.3	S23 29.7	109 45.9	S 8 13.8	349 49.4	N22 54.2	24 04.6	N20 07.2
01	107 37.7	200 44.3	29.8	124 46.7	13.1	4 52.2	54.3	39 07.2	07.2
02	122 40.1	215 43.4	30.0	139 47.4	12.3	19 55.1	54.3	54 09.9	07.2
03	137 42.6	230 42.4	. . 30.2	154 48.2	. . 11.6	34 57.9	. . 54.3	69 12.5	. . 07.1
04	152 45.0	245 41.5	30.3	169 49.0	10.8	50 00.7	54.4	84 15.2	07.1
05	167 47.5	260 40.5	30.5	184 49.7	10.1	65 03.5	54.4	99 17.8	07.1
06	182 50.0	275 39.5	S23 30.6	199 50.5	S 8 09.4	80 06.4	N22 54.4	114 20.5	N20 07.1
07	197 52.4	290 38.6	30.8	214 51.3	08.6	95 09.2	54.5	129 23.2	07.1
L 08	212 54.9	305 37.6	31.0	229 52.1	07.9	110 12.0	54.5	144 25.8	07.0
09	227 57.4	320 36.6	. . 31.1	244 52.8	. . 07.1	125 14.8	. . 54.5	159 28.5	. . 07.0
U 10	242 59.8	335 35.7	31.3	259 53.6	06.4	140 17.6	54.6	174 31.1	07.0
11	258 02.3	350 34.7	31.4	274 54.4	05.6	155 20.5	54.6	189 33.8	07.0
N 12	273 04.8	5 33.7	S23 31.6	289 55.2	S 8 04.9	170 23.3	N22 54.6	204 36.4	N20 07.0
E 13	288 07.2	20 32.8	31.8	304 55.9	04.2	185 26.1	54.7	219 39.1	06.9
14	303 09.7	35 31.8	31.9	319 56.7	03.4	200 28.9	54.7	234 41.7	06.9
S 15	318 12.1	50 30.8	. . 32.1	334 57.5	. . 02.7	215 31.8	. . 54.8	249 44.4	. . 06.9
16	333 14.6	65 29.9	32.2	349 58.3	01.9	230 34.6	54.8	264 47.0	06.9
17	348 17.1	80 28.9	32.4	4 59.0	01.2	245 37.4	54.8	279 49.7	06.9
18	3 19.5	95 28.0	S23 32.5	19 59.8	S 8 00.4	260 40.2	N22 54.9	294 52.4	N20 06.9
19	18 22.0	110 27.0	32.6	35 00.6	7 59.7	275 43.0	54.9	309 55.0	06.8
20	33 24.5	125 26.0	32.8	50 01.4	58.9	290 45.9	54.9	324 57.7	06.8
21	48 26.9	140 25.1	. . 32.9	65 02.1	. . 58.2	305 48.7	. . 55.0	340 00.3	. . 06.8
22	63 29.4	155 24.1	33.1	80 02.9	57.4	320 51.5	55.0	355 03.0	06.8
23	78 31.9	170 23.1	33.2	95 03.7	56.7	335 54.3	55.0	10 05.6	06.8
25 00	93 34.3	185 22.2	S23 33.4	110 04.5	S 7 56.0	350 57.2	N22 55.1	25 08.3	N20 06.7
01	108 36.8	200 21.2	33.5	125 05.2	55.2	6 00.0	55.1	40 10.9	06.7
02	123 39.3	215 20.2	33.6	140 06.0	54.5	21 02.8	55.1	55 13.6	06.7
03	138 41.7	230 19.3	. . 33.8	155 06.8	. . 53.7	36 05.6	. . 55.2	70 16.2	. . 06.7
04	153 44.2	245 18.3	33.9	170 07.6	53.0	51 08.4	55.2	85 18.9	06.7
05	168 46.6	260 17.3	34.0	185 08.4	52.2	66 11.3	55.2	100 21.5	06.6
06	183 49.1	275 16.4	S23 34.2	200 09.1	S 7 51.5	81 14.1	N22 55.3	115 24.2	N20 06.6
07	198 51.6	290 15.4	34.3	215 09.9	50.7	96 16.9	55.3	130 26.8	06.6
M 08	213 54.0	305 14.4	34.4	230 10.7	50.0	111 19.7	55.3	145 29.5	06.6
A 09	228 56.5	320 13.5	. . 34.6	245 11.5	. . 49.2	126 22.6	. . 55.4	160 32.2	. . 06.6
R 10	243 59.0	335 12.5	34.7	260 12.2	48.5	141 25.4	55.4	175 34.8	06.5
11	259 01.4	350 11.5	34.8	275 13.0	47.7	156 28.2	55.4	190 37.5	06.5
T 12	274 03.9	5 10.5	S23 34.9	290 13.8	S 7 47.0	171 31.0	N22 55.5	205 40.1	N20 06.5
13	289 06.4	20 09.6	35.1	305 14.6	46.2	186 33.9	55.5	220 42.8	06.5
E 14	304 08.8	35 08.6	35.2	320 15.3	45.5	201 36.7	55.6	235 45.4	06.5
S 15	319 11.3	50 07.6	. . 35.3	335 16.1	. . 44.8	216 39.5	. . 55.6	250 48.1	. . 06.5
16	334 13.8	65 06.7	35.4	350 16.9	44.0	231 42.3	55.6	265 50.7	06.4
17	349 16.2	80 05.7	35.5	5 17.7	43.3	246 45.2	55.7	280 53.4	06.4
18	4 18.7	95 04.7	S23 35.7	20 18.5	S 7 42.5	261 48.0	N22 55.7	295 56.0	N20 06.4
19	19 21.1	110 03.8	35.8	35 19.2	41.8	276 50.8	55.7	310 58.7	06.4
20	34 23.6	125 02.8	35.9	50 20.0	41.0	291 53.6	55.8	326 01.3	06.4
21	49 26.1	140 01.8	. . 36.0	65 20.8	. . 40.3	306 56.5	. . 55.8	341 04.0	. . 06.3
22	64 28.5	155 00.9	36.1	80 21.6	39.5	321 59.3	55.8	356 06.6	06.3
23	79 31.0	169 59.9	36.2	95 22.3	38.8	337 02.1	55.9	11 09.3	06.3
26 00	94 33.5	184 58.9	S23 36.3	110 23.1	S 7 38.0	352 04.9	N22 55.9	26 11.9	N20 06.3
01	109 35.9	199 58.0	36.4	125 23.9	37.3	7 07.8	55.9	41 14.6	06.3
02	124 38.4	214 57.0	36.5	140 24.7	36.5	22 10.6	56.0	56 17.2	06.2
03	139 40.9	229 56.0	. . 36.7	155 25.5	. . 35.8	37 13.4	. . 56.0	71 19.9	. . 06.2
04	154 43.3	244 55.1	36.8	170 26.2	35.0	52 16.2	56.0	86 22.5	06.2
05	169 45.8	259 54.1	36.9	185 27.0	34.3	67 19.1	56.1	101 25.2	06.2
06	184 48.2	274 53.1	S23 37.0	200 27.8	S 7 33.5	82 21.9	N22 56.1	116 27.8	N20 06.2
M 07	199 50.7	289 52.1	37.1	215 28.6	32.8	97 24.7	56.1	131 30.5	06.2
I 08	214 53.2	304 51.2	37.2	230 29.3	32.0	112 27.5	56.2	146 33.1	06.1
E 09	229 55.6	319 50.2	. . 37.3	245 30.1	. . 31.3	127 30.4	. . 56.2	161 35.8	. . 06.1
R 10	244 58.1	334 49.2	37.4	260 30.9	30.5	142 33.2	56.2	176 38.4	06.1
C 11	260 00.6	349 48.3	37.4	275 31.7	29.8	157 36.0	56.3	191 41.1	06.1
O 12	275 03.0	4 47.3	S23 37.5	290 32.5	S 7 29.0	172 38.8	N22 56.3	206 43.7	N20 06.1
L 13	290 05.5	19 46.3	37.6	305 33.2	28.3	187 41.7	56.3	221 46.4	06.0
E 14	305 08.0	34 45.4	37.7	320 34.0	27.5	202 44.5	56.4	236 49.0	06.0
S 15	320 10.4	49 44.4	. . 37.8	335 34.8	. . 26.8	217 47.3	. . 56.4	251 51.7	. . 06.0
16	335 12.9	64 43.4	37.9	350 35.6	26.0	232 50.1	56.5	266 54.3	06.0
17	350 15.4	79 42.4	38.0	5 36.4	25.3	247 53.0	56.5	281 57.0	06.0
18	5 17.8	94 41.5	S23 38.1	20 37.1	S 7 24.5	262 55.8	N22 56.5	296 59.6	N20 05.9
19	20 20.3	109 40.5	38.2	35 37.9	23.8	277 58.6	56.6	312 02.3	05.9
20	35 22.7	124 39.5	38.3	50 38.7	23.0	293 01.4	56.6	327 04.9	05.9
21	50 25.2	139 38.6	. . 38.3	65 39.5	. . 22.3	308 04.3	. . 56.6	342 07.6	. . 05.9
22	65 27.7	154 37.6	38.4	80 40.3	21.5	323 07.1	56.7	357 10.2	05.9
23	80 30.1	169 36.6	38.5	95 41.0	20.8	338 09.9	56.7	12 12.9	05.9
Pas. Mer.	h m 17 42.8	*v* −1.0	*d* 0.1	*v* 0.8	*d* 0.7	*v* 2.8	*d* 0.0	*v* 2.7	*d* 0.0

ESTRELLAS

Nombre	A.H.S.	Dec.
	° ′	° ′
Acamar	315 24.8	S40 18.1
Achernar	335 33.1	S57 14.0
Acrux	173 19.6	S63 06.2
Adhara	255 19.3	S28 58.4
Aldebaran	290 59.4	N16 30.8
Alioth	166 28.6	N55 56.8
Alkaid	153 06.1	N49 18.1
Al Na'ir	27 55.2	S46 57.4
Alnilam	275 55.2	S 1 12.1
Alphard	218 04.7	S 8 39.9
Alphecca	126 18.9	N26 42.4
Alpheratz	357 52.9	N29 06.1
Altair	62 17.4	N 8 52.4
Ankaa	353 24.5	S42 18.1
Antares	112 37.7	S26 26.1
Arcturus	146 04.1	N19 10.3
Atria	107 48.3	S69 01.7
Avior	234 21.2	S59 30.7
Bellatrix	278 41.4	N 6 21.1
Betelgeuse	271 10.7	N 7 24.4
Canopus	263 59.6	S52 41.8
Capella	280 47.4	N46 00.0
Deneb	49 38.1	N45 17.3
Denebola	182 42.8	N14 33.7
Diphda	349 04.9	S17 58.8
Dubhe	194 02.4	N61 44.2
Elnath	278 23.7	N28 36.5
Eltanin	90 50.9	N51 29.3
Enif	33 56.2	N 9 53.0
Fomalhaut	15 34.0	S29 37.0
Gacrux	172 11.2	S57 07.1
Gienah	176 01.6	S17 33.0
Hadar	149 01.2	S60 22.6
Hamal	328 10.8	N23 28.3
Kaus Aust.	83 56.2	S34 23.0
Kochab	137 20.3	N74 08.7
Markab	13 47.5	N15 12.9
Menkar	314 24.3	N 4 05.8
Menkent	148 18.5	S36 22.5
Miaplacidus	221 41.0	S69 43.2
Mirfak	308 53.0	N49 52.2
Nunki	76 09.9	S26 17.7
Peacock	53 33.9	S56 43.9
Pollux	243 38.4	N28 01.3
Procyon	245 08.9	N 5 13.2
Rasalhague	96 15.2	N12 33.5
Regulus	207 52.9	N11 57.5
Rigel	281 20.4	S 8 12.0
Rigil Kent.	140 04.7	S60 50.2
Sabik	102 23.3	S15 43.6
Schedar	349 50.9	N56 33.1
Shaula	96 34.6	S37 06.3
Sirius	258 41.4	S16 43.1
Spica	158 40.9	S11 10.1
Suhail	222 58.8	S43 26.2
Vega	80 45.5	N38 47.1
Zuben'ubi	137 15.7	S16 02.8

	A.H.S.	Pas. Mer.
	° ′	h m
Venus	91 47.8	11 39
Marte	16 30.1	16 39
Júpiter	257 22.8	0 36
Saturno	291 33.9	22 16

T.U.	SOL				LUNA						
	A.H.G.		Dec.		A.H.G.	v		Dec.	d	P.H.	
d h	°	′	°	′	°	′	′	°	′	′	′
24 00	180	08.9	S23	25.2	77	11.1	16.0	N 1	06.4	12.4	54.7
01	195	08.6		25.2	91	46.1	15.9	1	18.8	12.3	54.7
02	210	08.3		25.1	106	21.0	16.0	1	31.1	12.4	54.8
03	225	08.0	. .	25.1	120	56.0	15.9	1	43.5	12.4	54.8
04	240	07.7		25.0	135	30.9	15.9	1	55.9	12.4	54.8
05	255	07.4		25.0	150	05.8	15.8	2	08.3	12.3	54.8
06	270	07.1	S23	24.9	164	40.6	15.8	N 2	20.6	12.4	54.8
07	285	06.8		24.9	179	15.4	15.8	2	33.0	12.4	54.9
L 08	300	06.5		24.8	193	50.2	15.8	2	45.4	12.3	54.9
09	315	06.2	. .	24.8	208	25.0	15.7	2	57.7	12.4	54.9
U 10	330	05.8		24.7	222	59.7	15.7	3	10.1	12.4	54.9
11	345	05.5		24.7	237	34.4	15.7	3	22.5	12.3	54.9
N 12	0	05.2	S23	24.6	252	09.1	15.6	N 3	34.8	12.4	55.0
E 13	15	04.9		24.6	266	43.7	15.6	3	47.2	12.3	55.0
14	30	04.6		24.5	281	18.3	15.6	3	59.5	12.4	55.0
S 15	45	04.3	. .	24.5	295	52.9	15.5	4	11.9	12.3	55.0
16	60	04.0		24.4	310	27.4	15.5	4	24.2	12.4	55.0
17	75	03.7		24.4	325	01.9	15.4	4	36.6	12.3	55.1
18	90	03.4	S23	24.3	339	36.3	15.4	N 4	48.9	12.3	55.1
19	105	03.1		24.3	354	10.7	15.4	5	01.2	12.3	55.1
20	120	02.7		24.2	8	45.1	15.3	5	13.5	12.3	55.1
21	135	02.4	. .	24.1	23	19.4	15.2	5	25.8	12.3	55.2
22	150	02.1		24.1	37	53.6	15.2	5	38.1	12.3	55.2
23	165	01.8		24.0	52	27.8	15.2	5	50.4	12.3	55.2
25 00	180	01.5	S23	23.9	67	02.0	15.1	N 6	02.7	12.2	55.2
01	195	01.2		23.9	81	36.1	15.1	6	14.9	12.3	55.3
02	210	00.9		23.8	96	10.2	15.0	6	27.2	12.2	55.3
03	225	00.6	. .	23.8	110	44.2	15.0	6	39.4	12.2	55.3
04	240	00.3		23.7	125	18.2	14.9	6	51.6	12.2	55.3
05	255	00.0		23.6	139	52.1	14.9	7	03.8	12.2	55.4
06	269	59.6	S23	23.6	154	26.0	14.8	N 7	16.0	12.1	55.4
07	284	59.3		23.5	168	59.8	14.7	7	28.1	12.2	55.4
M 08	299	59.0		23.4	183	33.5	14.7	7	40.3	12.1	55.4
A 09	314	58.7	. .	23.4	198	07.2	14.7	7	52.4	12.1	55.5
10	329	58.4		23.3	212	40.9	14.6	8	04.5	12.1	55.5
R 11	344	58.1		23.2	227	14.5	14.5	8	16.6	12.0	55.5
12	359	57.8	S23	23.1	241	48.0	14.5	N 8	28.6	12.1	55.5
T 13	14	57.5		23.1	256	21.5	14.4	8	40.7	12.0	55.6
14	29	57.2		23.0	270	54.9	14.3	8	52.7	12.0	55.6
E 15	44	56.9	. .	22.9	285	28.2	14.3	9	04.7	11.9	55.6
S 16	59	56.6		22.8	300	01.5	14.2	9	16.6	12.0	55.6
17	74	56.2		22.8	314	34.7	14.1	9	28.6	11.9	55.7
18	89	55.9	S23	22.7	329	07.8	14.1	N 9	40.5	11.9	55.7
19	104	55.6		22.6	343	40.9	14.0	9	52.4	11.8	55.7
20	119	55.3		22.5	358	13.9	13.9	10	04.2	11.8	55.8
21	134	55.0	. .	22.5	12	46.8	13.9	10	16.0	11.8	55.8
22	149	54.7		22.4	27	19.7	13.8	10	27.8	11.8	55.8
23	164	54.4		22.3	41	52.5	13.7	10	39.6	11.7	55.8
26 00	179	54.1	S23	22.2	56	25.2	13.7	N10	51.3	11.7	55.9
01	194	53.8		22.1	70	57.9	13.6	11	03.0	11.6	55.9
02	209	53.5		22.0	85	30.5	13.5	11	14.6	11.6	55.9
03	224	53.2	. .	22.0	100	03.0	13.4	11	26.2	11.6	56.0
04	239	52.9		21.9	114	35.4	13.4	11	37.8	11.6	56.0
05	254	52.5		21.8	129	07.8	13.2	11	49.4	11.5	56.0
06	269	52.2	S23	21.7	143	40.0	13.2	N12	00.9	11.4	56.1
M 07	284	51.9		21.6	158	12.2	13.2	12	12.3	11.4	56.1
I 08	299	51.6		21.5	172	44.4	13.0	12	23.7	11.4	56.1
E 09	314	51.3	. .	21.4	187	16.4	13.0	12	35.1	11.3	56.1
R 10	329	51.0		21.3	201	48.4	12.8	12	46.4	11.3	56.2
11	344	50.7		21.3	216	20.2	12.8	12	57.7	11.3	56.2
C 12	359	50.4	S23	21.2	230	52.0	12.7	N13	09.0	11.2	56.2
O 13	14	50.1		21.1	245	23.7	12.7	13	20.2	11.1	56.3
L 14	29	49.8		21.0	259	55.4	12.5	13	31.3	11.1	56.3
E 15	44	49.5	. .	20.9	274	26.9	12.5	13	42.4	11.0	56.3
S 16	59	49.2		20.8	288	58.4	12.3	13	53.4	11.0	56.4
17	74	48.8		20.7	303	29.7	12.3	14	04.4	11.0	56.4
18	89	48.5	S23	20.6	318	01.0	12.2	N14	15.4	10.8	56.4
19	104	48.2		20.5	332	32.2	12.1	14	26.2	10.9	56.5
20	119	47.9		20.4	347	03.3	12.0	14	37.1	10.7	56.5
21	134	47.6	. .	20.3	1	34.3	11.9	14	47.8	10.8	56.5
22	149	47.3		20.2	16	05.2	11.9	14	58.6	10.6	56.6
23	164	47.0		20.1	30	36.1	11.7	N15	09.2	10.6	56.6
	SD	16.3	d	0.1	SD		15.0		15.1		15.3

Lat.	Crepúsculo Náutico	Crepúsculo Civil	Orto Sol	Orto Luna 24	Orto Luna 25	Orto Luna 26	Orto Luna 27
°	h m	h m	h m	h m	h m	h m	h m
N 72	08 27	10 57	▬	12 28	12 05	11 35	10 39
N 70	08 07	09 55	▬	12 33	12 17	11 59	11 30
68	07 51	09 20	▬	12 37	12 27	12 17	12 03
66	07 38	08 55	10 35	12 40	12 36	12 31	12 27
64	07 27	08 35	09 53	12 43	12 43	12 43	12 46
62	07 17	08 19	09 25	12 45	12 49	12 54	13 01
60	07 09	08 06	09 03	12 48	12 54	13 03	13 14
N 58	07 01	07 54	08 46	12 49	12 59	13 10	13 26
56	06 55	07 44	08 31	12 51	13 03	13 17	13 35
54	06 49	07 35	08 19	12 53	13 07	13 23	13 44
52	06 43	07 27	08 08	12 54	13 10	13 29	13 52
50	06 38	07 19	07 58	12 56	13 14	13 34	13 59
45	06 26	07 03	07 37	12 58	13 20	13 45	14 14
N 40	06 15	06 50	07 20	13 01	13 26	13 54	14 27
35	06 06	06 38	07 06	13 03	13 31	14 02	14 38
30	05 57	06 27	06 54	13 05	13 36	14 09	14 47
20	05 41	06 08	06 32	13 08	13 43	14 21	15 03
N 10	05 25	05 51	06 14	13 11	13 50	14 32	15 18
0	05 08	05 34	05 56	13 14	13 57	14 42	15 31
S 10	04 49	05 16	05 39	13 17	14 03	14 52	15 45
20	04 26	04 55	05 20	13 20	14 10	15 03	15 59
30	03 57	04 30	04 58	13 23	14 18	15 16	16 16
35	03 38	04 15	04 45	13 25	14 23	15 23	16 26
40	03 15	03 57	04 30	13 27	14 28	15 31	16 37
45	02 45	03 34	04 12	13 30	14 34	15 41	16 51
S 50	01 59	03 05	03 49	13 33	14 42	15 53	17 07
52	01 31	02 49	03 38	13 35	14 45	15 59	17 15
54	00 45	02 31	03 26	13 36	14 49	16 05	17 23
56	////	02 09	03 12	13 38	14 53	16 12	17 33
58	////	01 39	02 55	13 40	14 58	16 19	17 44
S 60	////	00 49	02 35	13 42	15 03	16 28	17 57

Lat.	Ocaso Sol	Crepúsculo Civil	Crepúsculo Náutico	Ocaso Luna 24	Ocaso Luna 25	Ocaso Luna 26	Ocaso Luna 27
°	h m	h m	h m	h m	h m	h m	h m
N 72	▬	13 03	15 33	01 08	03 00	05 02	07 38
N 70	▬	14 05	15 53	01 07	02 50	04 41	06 48
68	▬	14 40	16 09	01 05	02 42	04 24	06 17
66	13 25	15 05	16 22	01 04	02 35	04 11	05 54
64	14 07	15 25	16 33	01 03	02 30	04 00	05 37
62	14 35	15 41	16 43	01 02	02 25	03 51	05 22
60	14 57	15 55	16 51	01 01	02 21	03 43	05 10
N 58	15 14	16 06	16 59	01 01	02 17	03 36	04 59
56	15 29	16 16	17 06	01 00	02 14	03 30	04 50
54	15 42	16 26	17 12	00 59	02 11	03 25	04 42
52	15 53	16 34	17 18	00 59	02 08	03 20	04 35
50	16 03	16 41	17 23	00 59	02 06	03 16	04 28
45	16 23	16 57	17 35	00 58	02 01	03 06	04 14
N 40	16 40	17 11	17 45	00 57	01 56	02 58	04 03
35	16 54	17 23	17 54	00 56	01 53	02 51	03 53
30	17 07	17 33	18 03	00 55	01 49	02 46	03 44
20	17 28	17 52	18 19	00 54	01 44	02 35	03 30
N 10	17 46	18 09	18 36	00 53	01 39	02 26	03 17
0	18 04	18 26	18 53	00 52	01 34	02 18	03 05
S 10	18 21	18 45	19 12	00 51	01 30	02 10	02 53
20	18 40	19 05	19 34	00 50	01 25	02 01	02 41
30	19 02	19 30	20 03	00 49	01 19	01 51	02 26
35	19 15	19 45	20 22	00 49	01 16	01 45	02 18
40	19 30	20 03	20 45	00 48	01 12	01 39	02 08
45	19 48	20 26	21 16	00 47	01 08	01 31	01 57
S 50	20 11	20 56	22 01	00 46	01 03	01 22	01 44
52	20 22	21 11	22 29	00 45	01 01	01 18	01 38
54	20 34	21 29	23 15	00 45	00 58	01 13	01 31
56	20 48	21 51	////	00 44	00 55	01 08	01 24
58	21 05	22 20	////	00 44	00 52	01 02	01 15
S 60	21 25	23 10	////	00 43	00 49	00 56	01 06

Día	SOL E. T. (+) (−) 00h	SOL E. T. (+) (−) 12h	SOL Pas. Mer.	LUNA Pas. Mer. Sup.	LUNA Mer. Inf.	LUNA Edad	LUNA Fase
d	m s	m s	h m	h m	h m	d	%
24	00 36	00 22	12 00	19 24	07 03	10	65
25	00 07	00 08	12 00	20 07	07 45	11	74
26	00 23	00 38	12 01	20 54	08 30	12	83

(JUE., VIE., SAB.) 27, 28, 29 DICIEMBRE DEL 2001

T.U.	ARIES	VENUS −3.9		MARTE +0.7		JUPITER −2.7		SATURNO −0.3	
	A.H.G.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
27 00	95 32.6	184 35.7	S23 38.6	110 41.8	S 7 20.0	353 12.8	N22 56.7	27 15.5	N20 05.8
01	110 35.1	199 34.7	38.7	125 42.6	19.3	8 15.6	56.8	42 18.2	05.8
02	125 37.5	214 33.7	38.7	140 43.4	18.5	23 18.4	56.8	57 20.8	05.8
03	140 40.0	229 32.7	38.8	155 44.2	17.8	38 21.2	56.8	72 23.5	05.8
04	155 42.5	244 31.8	38.9	170 44.9	17.0	53 24.1	56.9	87 26.1	05.8
05	170 44.9	259 30.8	38.9	185 45.7	16.3	68 26.9	56.9	102 28.7	05.7
06	185 47.4	274 29.8	S23 39.0	200 46.5	S 7 15.5	83 29.7	N22 56.9	117 31.4	N20 05.7
07	200 49.9	289 28.9	39.1	215 47.3	14.8	98 32.5	57.0	132 34.0	05.7
J 08	215 52.3	304 27.9	39.2	230 48.1	14.0	113 35.4	57.0	147 36.7	05.7
U 09	230 54.8	319 26.9	39.2	245 48.8	13.3	128 38.2	57.0	162 39.3	05.7
E 10	245 57.2	334 25.9	39.3	260 49.6	12.5	143 41.0	57.1	177 42.0	05.7
V 11	260 59.7	349 25.0	39.4	275 50.4	11.8	158 43.8	57.1	192 44.6	05.6
E 12	276 02.2	4 24.0	S23 39.4	290 51.2	S 7 11.0	173 46.7	N22 57.1	207 47.3	N20 05.6
S 13	291 04.6	19 23.0	39.5	305 52.0	10.3	188 49.5	57.2	222 49.9	05.6
14	306 07.1	34 22.1	39.5	320 52.7	09.5	203 52.3	57.2	237 52.6	05.6
15	321 09.6	49 21.1	39.6	335 53.5	08.8	218 55.2	57.2	252 55.2	05.6
16	336 12.0	64 20.1	39.7	350 54.3	08.0	233 58.0	57.3	267 57.9	05.6
17	351 14.5	79 19.1	39.7	5 55.1	07.3	249 00.8	57.3	283 00.5	05.5
18	6 17.0	94 18.2	S23 39.8	20 55.9	S 7 06.5	264 03.6	N22 57.3	298 03.2	N20 05.5
19	21 19.4	109 17.2	39.8	35 56.6	05.8	279 06.5	57.4	313 05.8	05.5
20	36 21.9	124 16.2	39.9	50 57.4	05.0	294 09.3	57.4	328 08.4	05.5
21	51 24.4	139 15.3	39.9	65 58.2	04.3	309 12.1	57.4	343 11.1	05.5
22	66 26.8	154 14.3	40.0	80 59.0	03.5	324 14.9	57.5	358 13.7	05.4
23	81 29.3	169 13.3	40.0	95 59.8	02.8	339 17.8	57.5	13 16.4	05.4
28 00	96 31.7	184 12.3	S23 40.1	111 00.6	S 7 02.0	354 20.6	N22 57.5	28 19.0	N20 05.4
01	111 34.2	199 11.4	40.1	126 01.3	01.3	9 23.4	57.6	43 21.7	05 4
02	126 36.7	214 10.4	40.2	141 02.1	7 00.5	24 26.3	57.6	58 24.3	05.4
03	141 39.1	229 09.4	40.2	156 02.9	6 59.8	39 29.1	57.7	73 27.0	05.4
04	156 41.6	244 08.4	40.3	171 03.7	59.0	54 31.9	57.7	88 29.6	05.3
05	171 44.1	259 07.5	40.3	186 04.5	58.3	69 34.7	57.7	103 32.3	05.3
06	186 46.5	274 06.5	S23 40.3	201 05.3	S 6 57.5	84 37.6	N22 57.8	118 34.9	N20 05.3
07	201 49.0	289 05.5	40.4	216 06.0	56.8	99 40.4	57.8	133 37.5	05.3
V 08	216 51.5	304 04.6	40.4	231 06.8	56.0	114 43.2	57.8	148 40.2	05.3
I 09	231 53.9	319 03.6	40.5	246 07.6	55.3	129 46.1	57.9	163 42.8	05.3
E 10	246 56.4	334 02.6	40.5	261 08.4	54.5	144 48.9	57.9	178 45.5	05.2
R 11	261 58.9	349 01.6	40.5	276 09.2	53.8	159 51.7	57.9	193 48.1	05.2
N 12	277 01.3	4 00.7	S23 40.6	291 09.9	S 6 53.0	174 54.5	N22 58.0	208 50.8	N20 05.2
E 13	292 03.8	18 59.7	40.6	306 10.7	52.2	189 57.4	58.0	223 53.4	05.2
S 14	307 06.2	33 58.7	40.6	321 11.5	51.5	205 00.2	58.0	238 56.0	05.2
15	322 08.7	48 57.8	40.7	336 12.3	50.7	220 03.0	58.1	253 58.7	05.1
16	337 11.2	63 56.8	40.7	351 13.1	50.0	235 05.9	58.1	269 01.3	05.1
17	352 13.6	78 55.8	40.7	6 13.9	49.2	250 08.7	58.1	284 04.0	05.1
18	7 16.1	93 54.8	S23 40.7	21 14.6	S 6 48.5	265 11.5	N22 58.2	299 06.6	N20 05.1
19	22 18.6	108 53.9	40.8	36 15.4	47.7	280 14.3	58.2	314 09.3	05.1
20	37 21.0	123 52.9	40.8	51 16.2	47.0	295 17.2	58.2	329 11.9	05.1
21	52 23.5	138 51.9	40.8	66 17.0	46.2	310 20.0	58.3	344 14.5	05.0
22	67 26.0	153 50.9	40.8	81 17.8	45.5	325 22.8	58.3	359 17.2	05.0
23	82 28.4	168 50.0	40.8	96 18.6	44.7	340 25.7	58.3	14 19.8	05.0
29 00	97 30.9	183 49.0	S23 40.9	111 19.4	S 6 44.0	355 28.5	N22 58.4	29 22.5	N20 05.0
01	112 33.3	198 48.0	40.9	126 20.1	43.2	10 31.3	58.4	44 25.1	05.0
02	127 35.8	213 47.1	40.9	141 20.9	42.5	25 34.1	58.4	59 27.8	05.0
03	142 38.3	228 46.1	40.9	156 21.7	41.7	40 37.0	58.5	74 30.4	04.9
04	157 40.7	243 45.1	40.9	171 22.5	40.9	55 39.8	58.5	89 33.0	04.9
05	172 43.2	258 44.1	40.9	186 23.3	40.2	70 42.6	58.5	104 35.7	04.9
06	187 45.7	273 43.2	S23 40.9	201 24.1	S 6 39.4	85 45.5	N22 58.6	119 38.3	N20 04.9
07	202 48.1	288 42.2	41.0	216 24.8	38.7	100 48.3	58.6	134 41.0	04.9
S 08	217 50.6	303 41.2	41.0	231 25.6	37.9	115 51.1	58.6	149 43.6	04.9
A 09	232 53.1	318 40.2	41.0	246 26.4	37.2	130 53.9	58.7	164 46.3	04.8
B 10	247 55.5	333 39.3	41.0	261 27.2	36.4	145 56.8	58.7	179 48.9	04.8
A 11	262 58.0	348 38.3	41.0	276 28.0	35.7	160 59.6	58.7	194 51.5	04.8
D 12	278 00.5	3 37.3	S23 41.0	291 28.8	S 6 34.9	176 02.4	N22 58.8	209 54.2	N20 04.8
O 13	293 02.9	18 36.4	41.0	306 29.5	34.2	191 05.3	58.8	224 56.8	04.8
14	308 05.4	33 35.4	41.0	321 30.3	33.4	206 08.1	58.8	239 59.5	04.7
15	323 07.8	48 34.4	41.0	336 31.1	32.7	221 10.9	58.9	255 02.1	04.7
16	338 10.3	63 33.4	41.0	351 31.9	31.9	236 13.8	58.9	270 04.7	04.7
17	353 12.8	78 32.5	41.0	6 32.7	31.1	251 16.6	58.9	285 07.4	04.7
18	8 15.2	93 31.5	S23 41.0	21 33.5	S 6 30.4	266 19.4	N22 59.0	300 10.0	N20 04.7
19	23 17.7	108 30.5	41.0	36 34.3	29.6	281 22.2	59.0	315 12.7	04.7
20	38 20.2	123 29.5	41.0	51 35.0	28.9	296 25.1	59.0	330 15.3	04.6
21	53 22.6	138 28.6	40.9	66 35.8	28.1	311 27.9	59.1	345 17.9	04.6
22	68 25.1	153 27.6	40.9	81 36.6	27.4	326 30.7	59.1	0 20.6	04.6
23	83 27.6	168 26.6	40.9	96 37.4	26.6	341 33.6	59.1	15 23.2	04.6
Pas. Mer.	h m 17 31.0	v −1.0	d 0.0	v 0.8	d 0.8	v 2.8	d 0.0	v 2.6	d 0.0

ESTRELLAS

Nombre	A.H.S.	Dec.
	° ′	° ′
Acamar	315 24.9	S40 18.1
Achernar	335 33.2	S57 14.0
Acrux	173 19.6	S63 06.2
Adhara	255 19.2	S28 58.5
Aldebaran	290 59.4	N16 30.8
Alioth	166 28.6	N55 56.8
Alkaid	153 06.1	N49 18.0
Al Na'ir	27 55.2	S46 57.4
Alnilam	275 55.2	S 1 12.1
Alphard	218 04.7	S 8 39.9
Alphecca	126 18.9	N26 42.4
Alpheratz	357 52.9	N29 06.1
Altair	62 17.4	N 8 52.4
Ankaa	353 24.5	S42 18.1
Antares	112 37.7	S26 26.1
Arcturus	146 04.1	N19 10.3
Atria	107 48.3	S69 01.7
Avior	234 21.2	S59 30.8
Bellatrix	278 41.4	N 6 21.1
Betelgeuse	271 10.7	N 7 24.4
Canopus	263 59.6	S52 41.8
Capella	280 47.4	N46 00.0
Deneb	49 38.1	N45 17.3
Denebola	182 42.8	N14 33.7
Diphda	349 04.9	S17 58.8
Dubhe	194 02.3	N61 44.2
Elnath	278 23.7	N28 36.5
Eltanin	90 50.9	N51 29.3
Enif	33 56.2	N 9 53.0
Fomalhaut	15 34.0	S29 37.0
Gacrux	172 11.1	S57 07.1
Gienah	176 01.6	S17 33.0
Hadar	149 01.2	S60 22.6
Hamal	328 10.8	N23 28.3
Kaus Aust.	83 56.2	S34 23.0
Kochab	137 20.2	N74 08.7
Markab	13 47.5	N15 12.9
Menkar	314 24.3	N 4 05.8
Menkent	148 18.5	S36 22.5
Miaplacidus	221 41.0	S69 43.2
Mirfak	308 53.0	N49 52.2
Nunki	76 09.9	S26 17.7
Peacock	53 33.9	S56 43.9
Pollux	243 38.4	N28 01.3
Procyon	245 08.8	N 5 13.2
Rasalhague	96 15.2	N12 33.5
Regulus	207 52.9	N11 57.5
Rigel	281 20.4	S 8 12.0
Rigil Kent.	140 04.7	S60 50.2
Sabik	102 23.2	S15 43.6
Schedar	349 50.9	N56 33.1
Shaula	96 34.6	S37 06.3
Sirius	258 41.4	S16 43.1
Spica	158 40.9	S11 10.1
Suhail	222 58.8	S43 26.2
Vega	80 45.5	N38 47.1
Zuben'ubi	137 15.7	S16 02.9

	A.H.S.	Pas. Mer.
	° ′	h m
Venus	87 40.6	11 44
Marte	14 28.8	16 35
Júpiter	257 48.9	0 23
Saturno	291 47.3	22 03

T.U.	SOL				LUNA					
	A.H.G.		Dec.		A.H.G.	v	Dec.	d	P.H.	
d h	°	′	°	′	°	′	′	°	′	′	′
27 00	179	46.7	S23	20.0	45	06.8	11.7	N15	19.8	10.5	56.6
01	194	46.4		19.9	59	37.5	11.5	15	30.3	10.5	56.7
02	209	46.1		19.8	74	08.0	11.5	15	40.8	10.4	56.7
03	224	45.8	. .	19.7	88	38.5	11.3	15	51.2	10.3	56.7
04	239	45.5		19.6	103	08.8	11.3	16	01.5	10.3	56.8
05	254	45.2		19.5	117	39.1	11.2	16	11.8	10.2	56.8
06	269	44.9	S23	19.4	132	09.3	11.0	N16	22.0	10.1	56.8
07	284	44.5		19.3	146	39.3	11.0	16	32.1	10.1	56.9
J 08	299	44.2		19.2	161	09.3	10.9	16	42.2	10.0	56.9
U 09	314	43.9	. .	19.0	175	39.2	10.8	16	52.2	9.9	56.9
E 10	329	43.6		18.9	190	09.0	10.7	17	02.1	9.8	57.0
V 11	344	43.3		18.8	204	38.7	10.6	17	11.9	9.8	57.0
12	359	43.0	S23	18.7	219	08.3	10.4	N17	21.7	9.7	57.0
E 13	14	42.7		18.6	233	37.7	10.4	17	31.4	9.6	57.1
14	29	42.4		18.5	248	07.1	10.3	17	41.0	9.5	57.1
S 15	44	42.1	. .	18.4	262	36.4	10.2	17	50.5	9.5	57.1
16	59	41.8		18.3	277	05.6	10.1	18	00.0	9.3	57.2
17	74	41.5		18.2	291	34.7	10.0	18	09.3	9.3	57.2
18	89	41.2	S23	18.0	306	03.7	9.9	N18	18.6	9.2	57.2
19	104	40.9		17.9	320	32.6	9.7	18	27.8	9.1	57.3
20	119	40.6		17.8	335	01.3	9.7	18	36.9	9.0	57.3
21	134	40.3	. .	17.7	349	30.0	9.6	18	45.9	8.9	57.3
22	149	40.0		17.6	3	58.6	9.5	18	54.8	8.9	57.4
23	164	39.7		17.4	18	27.1	9.3	19	03.7	8.7	57.4
28 00	179	39.3	S23	17.3	32	55.4	9.3	N19	12.4	8.6	57.4
01	194	39.0		17.2	47	23.7	9.2	19	21.0	8.6	57.5
02	209	38.7		17.1	61	51.9	9.0	19	29.6	8.4	57.5
03	224	38.4	. .	17.0	76	19.9	9.0	19	38.0	8.4	57.5
04	239	38.1		16.8	90	47.9	8.9	19	46.4	8.2	57.6
05	254	37.8		16.7	105	15.8	8.7	19	54.6	8.2	57.6
06	269	37.5	S23	16.6	119	43.5	8.7	N20	02.8	8.0	57.6
07	284	37.2		16.5	134	11.2	8.5	20	10.8	8.0	57.7
V 08	299	36.9		16.3	148	38.7	8.5	20	18.8	7.8	57.7
I 09	314	36.6	. .	16.2	163	06.2	8.3	20	26.6	7.7	57.7
E 10	329	36.3		16.1	177	33.5	8.3	20	34.3	7.6	57.8
R 11	344	36.0		15.9	192	00.8	8.1	20	41.9	7.6	57.8
12	359	35.7	S23	15.8	206	27.9	8.1	N20	49.5	7.3	57.8
N 13	14	35.4		15.7	220	55.0	7.9	20	56.8	7.3	57.9
E 14	29	35.1		15.5	235	21.9	7.9	21	04.1	7.2	57.9
S 15	44	34.8	. .	15.4	249	48.8	7.7	21	11.3	7.0	57.9
16	59	34.5		15.3	264	15.5	7.7	21	18.3	7.0	57.9
17	74	34.2		15.1	278	42.2	7.5	21	25.3	6.8	58.0
18	89	33.9	S23	15.0	293	08.7	7.5	N21	32.1	6.7	58.0
19	104	33.6		14.9	307	35.2	7.3	21	38.8	6.5	58.0
20	119	33.3		14.7	322	01.5	7.3	21	45.3	6.5	58.1
21	134	33.0	. .	14.6	336	27.8	7.2	21	51.8	6.3	58.1
22	149	32.7		14.5	350	54.0	7.0	21	58.1	6.2	58.1
23	164	32.3		14.3	5	20.0	7.0	22	04.3	6.1	58.2
29 00	179	32.0	S23	14.2	19	46.0	6.9	N22	10.4	5.9	58.2
01	194	31.7		14.0	34	11.9	6.8	22	16.3	5.8	58.2
02	209	31.4		13.9	48	37.7	6.7	22	22.1	5.7	58.3
03	224	31.1	. .	13.8	63	03.4	6.6	22	27.8	5.5	58.3
04	239	30.8		13.6	77	29.0	6.5	22	33.3	5.5	58.3
05	254	30.5		13.5	91	54.5	6.5	22	38.8	5.2	58.4
06	269	30.2	S23	13.3	106	20.0	6.3	N22	44.0	5.2	58.4
S 07	284	29.9		13.2	120	45.3	6.3	22	49.2	5.0	58.4
08	299	29.6		13.0	135	10.6	6.1	22	54.2	4.8	58.5
A 09	314	29.3	. .	12.9	149	35.7	6.1	22	59.0	4.7	58.5
B 10	329	29.0		12.7	164	00.8	6.0	23	03.7	4.6	58.5
11	344	28.7		12.6	178	25.8	6.0	23	08.3	4.4	58.5
A 12	359	28.4	S23	12.4	192	50.8	5.8	N23	12.7	4.3	58.6
13	14	28.1		12.3	207	15.6	5.8	23	17.0	4.2	58.6
D 14	29	27.8		12.1	221	40.4	5.7	23	21.2	4.0	58.6
O 15	44	27.5	. .	12.0	236	05.1	5.6	23	25.2	3.8	58.7
16	59	27.2		11.8	250	29.7	5.5	23	29.0	3.7	58.7
17	74	26.9		11.7	264	54.2	5.5	23	32.7	3.6	58.7
18	89	26.6	S23	11.5	279	18.7	5.4	N23	36.3	3.4	58.7
19	104	26.3		11.4	293	43.1	5.3	23	39.7	3.2	58.8
20	119	26.0		11.2	308	07.4	5.3	23	42.9	3.1	58.8
21	134	25.7	. .	11.0	322	31.7	5.2	23	46.0	2.9	58.8
22	149	25.4		10.9	336	55.9	5.1	23	48.9	2.8	58.9
23	164	25.1		10.7	351	20.0	5.1	N23	51.7	2.7	58.9
	SD	16.3	d	0.1	SD		15.5		15.8		16.0

Lat.	Crepúsculo Náutico	Crepúsculo Civil	Orto Sol	Orto Luna 27	Orto Luna 28	Orto Luna 29	Orto Luna 30
°	h m	h m	h m	h m	h m	h m	h m
N 72	08 27	10 53	▬	10 39	▭	▭	▭
N 70	08 07	09 54	▬	11 30	▭	▭	▭
68	07 51	09 20	▬	12 03	11 38	▭	▭
66	07 38	08 55	10 33	12 27	12 22	12 16	▭
64	07 27	08 35	09 52	12 46	12 52	13 06	13 45
62	07 18	08 20	09 25	13 01	13 14	13 38	14 23
60	07 10	08 06	09 04	13 14	13 32	14 02	14 50
N 58	07 02	07 55	08 46	13 26	13 47	14 21	15 11
56	06 55	07 44	08 32	13 35	14 00	14 37	15 29
54	06 49	07 35	08 19	13 44	14 12	14 50	15 43
52	06 44	07 27	08 08	13 52	14 22	15 02	15 56
50	06 38	07 20	07 58	13 59	14 31	15 13	16 08
45	06 27	07 04	07 38	14 14	14 50	15 35	16 31
N 40	06 17	06 51	07 21	14 27	15 06	15 53	16 50
35	06 07	06 39	07 07	14 38	15 19	16 08	17 06
30	05 59	06 28	06 55	14 47	15 31	16 21	17 20
20	05 42	06 10	06 34	15 03	15 51	16 44	17 43
N 10	05 26	05 52	06 15	15 18	16 08	17 04	18 03
0	05 09	05 35	05 58	15 31	16 24	17 22	18 22
S 10	04 50	05 17	05 40	15 45	16 41	17 40	18 41
20	04 28	04 57	05 22	15 59	16 59	18 00	19 02
30	03 59	04 32	05 00	16 16	17 19	18 23	19 25
35	03 40	04 17	04 47	16 26	17 31	18 36	19 39
40	03 17	03 59	04 32	16 37	17 45	18 52	19 55
45	02 47	03 36	04 14	16 51	18 01	19 11	20 14
S 50	02 02	03 07	03 51	17 07	18 22	19 34	20 38
52	01 35	02 52	03 41	17 15	18 31	19 45	20 49
54	00 50	02 34	03 28	17 23	18 42	19 58	21 03
56	////	02 12	03 14	17 33	18 55	20 12	21 18
58	////	01 43	02 58	17 44	19 09	20 29	21 35
S 60	////	00 55	02 37	17 57	19 26	20 50	21 57

Lat.	Ocaso Sol	Crepúsculo Civil	Crepúsculo Náutico	Ocaso Luna 27	Ocaso Luna 28	Ocaso Luna 29	Ocaso Luna 30
°	h m	h m	h m	h m	h m	h m	h m
N 72	▬	13 11	15 37	07 38	▭	▭	▭
N 70	▬	14 10	15 57	06 48	▭	▭	▭
68	▬	14 44	16 12	06 17	08 30	▭	▭
66	13 30	15 09	16 25	05 54	07 47	09 50	▭
64	14 11	15 28	16 36	05 37	07 18	09 01	10 27
62	14 39	15 44	16 46	05 22	06 56	08 29	09 49
60	15 00	15 57	16 54	05 10	06 39	08 06	09 22
N 58	15 17	16 09	17 01	04 59	06 24	07 47	09 01
56	15 32	16 19	17 08	04 50	06 12	07 32	08 43
54	15 44	16 28	17 14	04 42	06 01	07 18	08 29
52	15 55	16 36	17 20	04 35	05 51	07 06	08 16
50	16 05	16 43	17 25	04 28	05 42	06 56	08 05
45	16 26	16 59	17 37	04 14	05 24	06 34	07 41
N 40	16 42	17 13	17 47	04 03	05 09	06 17	07 22
35	16 56	17 24	17 56	03 53	04 57	06 02	07 07
30	17 09	17 35	18 05	03 44	04 46	05 50	06 53
20	17 30	17 54	18 21	03 30	04 27	05 28	06 30
N 10	17 48	18 11	18 37	03 17	04 11	05 09	06 09
0	18 05	18 28	18 54	03 05	03 56	04 51	05 50
S 10	18 23	18 46	19 13	02 53	03 41	04 34	05 32
20	18 42	19 06	19 35	02 41	03 25	04 15	05 11
30	19 04	19 31	20 04	02 26	03 07	03 54	04 48
35	19 16	19 46	20 23	02 18	02 56	03 41	04 34
40	19 31	20 04	20 46	02 08	02 44	03 27	04 18
45	19 49	20 27	21 16	01 57	02 29	03 09	04 00
S 50	20 12	20 56	22 01	01 44	02 12	02 48	03 36
52	20 22	21 11	22 28	01 38	02 04	02 38	03 25
54	20 34	21 29	23 11	01 31	01 55	02 27	03 12
56	20 49	21 50	////	01 24	01 44	02 14	02 57
58	21 05	22 19	////	01 15	01 33	01 59	02 40
S 60	21 25	23 07	////	01 06	01 19	01 42	02 19

Día	SOL E. T. (−) 00h	SOL E. T. (−) 12h	Pas. Mer.	LUNA Pas. Sup.	LUNA Mer. Inf.	Edad	Fase
d	m s	m s	h m	h m	h m	d	%
27	00 53	01 07	12 01	21 44	09 18	13	90
28	01 22	01 37	12 02	22 38	10 10	14	95
29	01 51	02 06	12 02	23 36	11 07	15	99

(DOM., LUN., MAR.) 30, 31 DICIEMBRE, 1 ENERO DEL 2001

T.U.	ARIES	VENUS −3.9		MARTE +0.7		JUPITER −2.7		SATURNO −0.3		ESTRELLAS		
	A.H.G.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.	A.H.G.	Dec.	Nombre	A.H.S.	Dec.
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′		° ′	° ′
30 00	98 30.0	183 25.7	S23 40.9	111 38.2	S 6 25.9	356 36.4	N22 59.2	30 25.9	N20 04.6	Acamar	315 24.9	S40 18.1
01	113 32.5	198 24.7	40.9	126 39.0	25.1	11 39.2	59.2	45 28.5	04.6	Achernar	335 33.2	S57 14.0
02	128 35.0	213 23.7	40.9	141 39.8	24.3	26 42.0	59.2	60 31.1	04.5	Acrux	173 19.5	S63 06.2
03	143 37.4	228 22.7	40.9	156 40.5	23.6	41 44.9	59.3	75 33.8	04.5	Adhara	255 19.2	S28 58.5
04	158 39.9	243 21.8	40.8	171 41.3	22.8	56 47.7	59.3	90 36.4	04.5	Aldebaran	290 59.4	N16 30.8
05	173 42.3	258 20.8	40.8	186 42.1	22.1	71 50.5	59.3	105 39.1	04.5			
06	188 44.8	273 19.8	S23 40.8	201 42.9	S 6 21.3	86 53.4	N22 59.4	120 41.7	N20 04.5	Alioth	166 28.5	N55 56.7
07	203 47.3	288 18.9	40.8	216 43.7	20.6	101 56.2	59.4	135 44.3	04.5	Alkaid	153 06.1	N49 18.0
D 08	218 49.7	303 17.9	40.8	231 44.5	19.8	116 59.0	59.4	150 47.0	04.4	Al Na'ir	27 55.2	S46 57.4
O 09	233 52.2	318 16.9	40.7	246 45.3	19.1	132 01.9	59.5	165 49.6	04.4	Alnilam	275 55.2	S 1 12.1
M 10	248 54.7	333 15.9	40.7	261 46.1	18.3	147 04.7	59.5	180 52.2	04.4	Alphard	218 04.7	S 8 39.9
I 11	263 57.1	348 15.0	40.7	276 46.8	17.5	162 07.5	59.5	195 54.9	04.4			
N 12	278 59.6	3 14.0	S23 40.7	291 47.6	S 6 16.8	177 10.3	N22 59.6	210 57.5	N20 04.4	Alphecca	126 18.9	N26 42.4
G 13	294 02.1	18 13.0	40.6	306 48.4	16.0	192 13.2	59.6	226 00.2	04.4	Alpheratz	357 52.9	N29 06.1
O 14	309 04.5	33 12.0	40.6	321 49.2	15.3	207 16.0	59.6	241 02.8	04.3	Altair	62 17.4	N 8 52.4
15	324 07.0	48 11.1	40.6	336 50.0	14.5	222 18.8	59.7	256 05.4	04.3	Ankaa	353 24.5	S42 18.1
16	339 09.5	63 10.1	40.5	351 50.8	13.8	237 21.7	59.7	271 08.1	04.3	Antares	112 37.7	S26 26.1
17	354 11.9	78 09.1	40.5	6 51.6	13.0	252 24.5	59.7	286 10.7	04.3			
18	9 14.4	93 08.2	S23 40.5	21 52.4	S 6 12.3	267 27.3	N22 59.8	301 13.3	N20 04.3	Arcturus	146 04.1	N19 10.3
19	24 16.8	108 07.2	40.4	36 53.1	11.5	282 30.2	59.8	316 16.0	04.3	Atria	107 48.2	S69 01.7
20	39 19.3	123 06.2	40.4	51 53.9	10.7	297 33.0	59.8	331 18.6	04.2	Avior	234 21.2	S59 30.8
21	54 21.8	138 05.2	40.3	66 54.7	10.0	312 35.8	59.9	346 21.3	04.2	Bellatrix	278 41.4	N 6 21.1
22	69 24.2	153 04.3	40.3	81 55.5	09.2	327 38.6	59.9	1 23.9	04.2	Betelgeuse	271 10.7	N 7 24.4
23	84 26.7	168 03.3	40.3	96 56.3	08.5	342 41.5	22 59.9	16 26.5	04.2			
31 00	99 29.2	183 02.3	S23 40.2	111 57.1	S 6 07.7	357 44.3	N23 00.0	31 29.2	N20 04.2	Canopus	263 59.6	S52 41.8
01	114 31.6	198 01.4	40.2	126 57.9	07.0	12 47.1	00.0	46 31.8	04.2	Capella	280 47.3	N46 00.0
02	129 34.1	213 00.4	40.1	141 58.7	06.2	27 50.0	00.0	61 34.4	04.2	Deneb	49 38.1	N45 17.3
03	144 36.6	227 59.4	40.1	156 59.4	05.4	42 52.8	00.1	76 37.1	04.1	Denebola	182 42.8	N14 33.7
04	159 39.0	242 58.4	40.0	172 00.2	04.7	57 55.6	00.1	91 39.7	04.1	Diphda	349 04.9	S17 58.8
05	174 41.5	257 57.5	40.0	187 01.0	03.9	72 58.5	00.1	106 42.3	04.1			
06	189 44.0	272 56.5	S23 39.9	202 01.8	S 6 03.2	88 01.3	N23 00.2	121 45.0	N20 04.1	Dubhe	194 02.3	N61 44.2
07	204 46.4	287 55.5	39.9	217 02.6	02.4	103 04.1	00.2	136 47.6	04.1	Elnath	278 23.7	N28 36.5
L 08	219 48.9	302 54.6	39.8	232 03.4	01.7	118 06.9	00.2	151 50.2	04.1	Eltanin	90 50.9	N51 29.3
U 09	234 51.3	317 53.6	39.8	247 04.2	00.9	133 09.8	00.3	166 52.9	04.0	Enif	33 56.2	N 9 53.0
N 10	249 53.8	332 52.6	39.7	262 05.0	6 00.1	148 12.6	00.3	181 55.5	04.0	Fomalhaut	15 34.0	S29 37.0
E 11	264 56.3	347 51.6	39.7	277 05.8	5 59.4	163 15.4	00.3	196 58.2	04.0			
S 12	279 58.7	2 50.7	S23 39.6	292 06.5	S 5 58.6	178 18.3	N23 00.4	212 00.8	N20 04.0	Gacrux	172 11.1	S57 07.1
13	295 01.2	17 49.7	39.5	307 07.3	57.9	193 21.1	00.4	227 03.4	04.0	Gienah	176 01.6	S17 33.0
14	310 03.7	32 48.7	39.5	322 08.1	57.1	208 23.9	00.4	242 06.1	04.0	Hadar	149 01.1	S60 22.6
15	325 06.1	47 47.8	39.4	337 08.9	56.4	223 26.8	00.5	257 08.7	03.9	Hamal	328 10.8	N23 28.3
16	340 08.6	62 46.8	39.4	352 09.7	55.6	238 29.6	00.5	272 11.3	03.9	Kaus Aust.	83 56.2	S34 23.0
17	355 11.1	77 45.8	39.3	7 10.5	54.8	253 32.4	00.5	287 14.0	03.9			
18	10 13.5	92 44.8	S23 39.2	22 11.3	S 5 54.1	268 35.2	N23 00.6	302 16.6	N20 03.9	Kochab	137 20.2	N74 08.6
19	25 16.0	107 43.9	39.2	37 12.1	53.3	283 38.1	00.6	317 19.2	03.9	Markab	13 47.5	N15 12.9
20	40 18.5	122 42.9	39.1	52 12.9	52.6	298 40.9	00.6	332 21.9	03.9	Menkar	314 24.3	N 4 05.8
21	55 20.9	137 41.9	39.0	67 13.6	51.8	313 43.7	00.7	347 24.5	03.8	Menkent	148 18.4	S36 22.5
22	70 23.4	152 41.0	38.9	82 14.4	51.1	328 46.6	00.7	2 27.1	03.8	Miaplacidus	221 41.0	S69 43.2
23	85 25.8	167 40.0	38.9	97 15.2	50.3	343 49.4	00.7	17 29.8	03.8			
1 00	100 28.3	182 39.0	S23 38.8	112 16.0	S 5 49.5	358 52.2	N23 00.8	32 32.4	N20 03.8	Mirfak	308 53.0	N49 52.2
01	115 30.8	197 38.0	38.7	127 16.8	48.8	13 55.1	00.8	47 35.0	03.8	Nunki	76 09.9	S26 17.7
02	130 33.2	212 37.1	38.6	142 17.6	48.0	28 57.9	00.8	62 37.7	03.8	Peacock	53 33.9	S56 43.9
03	145 35.7	227 36.1	38.6	157 18.4	47.3	44 00.7	00.9	77 40.3	03.8	Pollux	243 38.4	N28 01.3
04	160 38.2	242 35.1	38.5	172 19.2	46.5	59 03.6	00.9	92 42.9	03.7	Procyon	245 08.8	N 5 13.2
05	175 40.6	257 34.2	38.4	187 20.0	45.7	74 06.4	00.9	107 45.6	03.7			
06	190 43.1	272 33.2	S23 38.3	202 20.8	S 5 45.0	89 09.2	N23 01.0	122 48.2	N20 03.7	Rasalhague	96 15.2	N12 33.5
07	205 45.6	287 32.2	38.2	217 21.5	44.2	104 12.0	01.0	137 50.8	03.7	Regulus	207 52.9	N11 57.5
M 08	220 48.0	302 31.3	38.2	232 22.3	43.5	119 14.9	01.0	152 53.5	03.7	Rigel	281 20.4	S 8 12.0
A 09	235 50.5	317 30.3	38.1	247 23.1	42.7	134 17.7	01.1	167 56.1	03.7	Rigil Kent.	140 04.6	S60 50.2
R 10	250 53.0	332 29.3	38.0	262 23.9	42.0	149 20.5	01.1	182 58.7	03.6	Sabik	102 23.2	S15 43.6
T 11	265 55.4	347 28.3	37.9	277 24.7	41.2	164 23.4	01.1	198 01.3	03.6			
E 12	280 57.9	2 27.4	S23 37.8	292 25.5	S 5 40.4	179 26.2	N23 01.2	213 04.0	N20 03.6	Schedar	349 50.9	N56 33.1
13	296 00.3	17 26.4	37.7	307 26.3	39.7	194 29.0	01.2	228 06.6	03.6	Shaula	96 34.6	S37 06.3
S 14	311 02.8	32 25.4	37.6	322 27.1	38.9	209 31.9	01.2	243 09.2	03.6	Sirius	258 41.3	S16 43.1
15	326 05.3	47 24.5	37.5	337 27.9	38.2	224 34.7	01.3	258 11.9	03.6	Spica	158 40.9	S11 10.2
16	341 07.7	62 23.5	37.4	352 28.7	37.4	239 37.5	01.3	273 14.5	03.6	Suhail	222 58.8	S43 26.2
17	356 10.2	77 22.5	37.3	7 29.4	36.6	254 40.3	01.3	288 17.1	03.5			
18	11 12.7	92 21.6	S23 37.2	22 30.2	S 5 35.9	269 43.2	N23 01.4	303 19.8	N20 03.5	Vega	80 45.5	N38 47.1
19	26 15.1	107 20.6	37.1	37 31.0	35.1	284 46.0	01.4	318 22.4	03.5	Zuben'ubi	137 15.6	S16 02.9
20	41 17.6	122 19.6	37.0	52 31.8	34.4	299 48.8	01.4	333 25.0	03.5		A.H.S.	Pas. Mer.
21	56 20.1	137 18.7	36.9	67 32.6	33.6	314 51.7	01.5	348 27.7	03.5		° ′	h m
22	71 22.5	152 17.7	36.8	82 33.4	32.8	329 54.5	01.5	3 30.3	03.5	Venus	83 33.2	11 49
23	86 25.0	167 16.7	36.7	97 34.2	32.1	344 57.3	01.5	18 32.9	03.4	Marte	12 27.9	16 31
	h m									Júpiter	258 15.1	0 09
Pas. Mer.	17 19.2	v −1.0	d 0.1	v 0.8	d 0.8	v 2.8	d 0.0	v 2.6	d 0.0	Saturno	292 00.0	21 50

T.U.	SOL				LUNA					
	A.H.G.		Dec.		A.H.G.	v	Dec.	d	P.H.	
d h	°	′	°	′	°	′	′	°	′	′	′
30 00	179	24.8	S23	10.6	5	44.1	5.0	N23	54.4	2.4	58.9
01	194	24.5		10.4	20	08.1	4.9	23	56.8	2.3	58.9
02	209	24.2		10.2	34	32.0	4.9	23	59.1	2.2	59.0
03	224	23.9	. .	10.1	48	55.9	4.9	24	01.3	2.0	59.0
04	239	23.6		09.9	63	19.8	4.8	24	03.3	1.8	59.0
05	254	23.3		09.8	77	43.6	4.7	24	05.1	1.7	59.0
06	269	23.0	S23	09.6	92	07.3	4.7	N24	06.8	1.5	59.1
D 07	284	22.7		09.4	106	31.0	4.6	24	08.3	1.4	59.1
08	299	22.4		09.3	120	54.6	4.6	24	09.7	1.1	59.1
O 09	314	22.1	. .	09.1	135	18.2	4.5	24	10.8	1.1	59.1
M 10	329	21.8		08.9	149	41.7	4.6	24	11.9	0.8	59.2
I 11	344	21.5		08.8	164	05.3	4.4	24	12.7	0.7	59.2
12	359	21.2	S23	08.6	178	28.7	4.5	N24	13.4	0.6	59.2
N 13	14	20.9		08.4	192	52.2	4.3	24	14.0	0.3	59.2
14	29	20.6		08.2	207	15.5	4.4	24	14.3	0.2	59.3
G 15	44	20.3	. .	08.1	221	38.9	4.3	24	14.5	0.0	59.3
O 16	59	20.0		07.9	236	02.2	4.4	24	14.5	0.1	59.3
17	74	19.7		07.7	250	25.6	4.2	24	14.4	0.3	59.3
18	89	19.4	S23	07.6	264	48.8	4.3	N24	14.1	0.5	59.3
19	104	19.1		07.4	279	12.1	4.2	24	13.6	0.6	59.4
20	119	18.8		07.2	293	35.3	4.2	24	13.0	0.8	59.4
21	134	18.5	. .	07.0	307	58.5	4.2	24	12.2	1.0	59.4
22	149	18.2		06.9	322	21.7	4.2	24	11.2	1.1	59.4
23	164	17.9		06.7	336	44.9	4.2	24	10.1	1.3	59.4
31 00	179	17.6	S23	06.5	351	08.1	4.1	N24	08.8	1.5	59.5
01	194	17.3		06.3	5	31.2	4.2	24	07.3	1.7	59.5
02	209	17.0		06.1	19	54.4	4.1	24	05.6	1.8	59.5
03	224	16.7	. .	06.0	34	17.5	4.2	24	03.8	2.0	59.5
04	239	16.4		05.8	48	40.7	4.1	24	01.8	2.1	59.5
05	254	16.1		05.6	63	03.8	4.1	23	59.7	2.4	59.6
06	269	15.8	S23	05.4	77	26.9	4.2	N23	57.3	2.5	59.6
07	284	15.5		05.2	91	50.1	4.1	23	54.8	2.6	59.6
L 08	299	15.2		05.0	106	13.2	4.2	23	52.2	2.9	59.6
09	314	14.9	. .	04.8	120	36.4	4.1	23	49.3	3.0	59.6
U 10	329	14.6		04.7	134	59.5	4.2	23	46.3	3.1	59.6
11	344	14.3		04.5	149	22.7	4.2	23	43.2	3.3	59.7
N 12	359	14.0	S23	04.3	163	45.9	4.2	N23	39.9	3.5	59.7
E 13	14	13.7		04.1	178	09.1	4.2	23	36.4	3.7	59.7
14	29	13.4		03.9	192	32.3	4.2	23	32.7	3.8	59.7
S 15	44	13.1	. .	03.7	206	55.5	4.3	23	28.9	4.0	59.7
16	59	12.9		03.5	221	18.8	4.2	23	24.9	4.2	59.7
17	74	12.6		03.3	235	42.0	4.4	23	20.7	4.3	59.7
18	89	12.3	S23	03.1	250	05.4	4.3	N23	16.4	4.5	59.8
19	104	12.0		02.9	264	28.7	4.3	23	11.9	4.7	59.8
20	119	11.7		02.7	278	52.0	4.4	23	07.2	4.8	59.8
21	134	11.4	. .	02.6	293	15.4	4.5	23	02.4	5.0	59.8
22	149	11.1		02.4	307	38.9	4.4	22	57.4	5.1	59.8
23	164	10.8		02.2	322	02.3	4.5	22	52.3	5.3	59.8
1 00	179	10.5	S23	02.0	336	25.8	4.6	N22	47.0	5.5	59.8
01	194	10.2		01.8	350	49.4	4.5	22	41.5	5.6	59.8
02	209	09.9		01.6	5	12.9	4.7	22	35.9	5.7	59.9
03	224	09.6	. .	01.4	19	36.6	4.6	22	30.2	6.0	59.9
04	239	09.3		01.2	34	00.2	4.7	22	24.2	6.1	59.9
05	254	09.0		01.0	48	23.9	4.8	22	18.1	6.2	59.9
06	269	08.7	S23	00.8	62	47.7	4.8	N22	11.9	6.4	59.9
07	284	08.4		00.6	77	11.5	4.8	22	05.5	6.5	59.9
M 08	299	08.1		00.3	91	35.3	4.9	21	59.0	6.7	59.9
A 09	314	07.8	23	00.1	105	59.2	5.0	21	52.3	6.9	59.9
R 10	329	07.5	22	59.9	120	23.2	5.0	21	45.4	7.0	59.9
11	344	07.2		59.7	134	47.2	5.1	21	38.4	7.1	59.9
T 12	359	07.0	S22	59.5	149	11.3	5.1	N21	31.3	7.3	59.9
13	14	06.7		59.3	163	35.4	5.2	21	24.0	7.5	60.0
E 14	29	06.4		59.1	177	59.6	5.2	21	16.5	7.6	60.0
S 15	44	06.1	. .	58.9	192	23.8	5.3	21	08.9	7.7	60.0
16	59	05.8		58.7	206	48.1	5.4	21	01.2	7.9	60.0
17	74	05.5		58.5	221	12.5	5.4	20	53.3	8.0	60.0
18	89	05.2	S22	58.3	235	36.9	5.5	N20	45.3	8.1	60.0
19	104	04.9		58.0	250	01.4	5.6	20	37.2	8.3	60.0
20	119	04.6		57.8	264	26.0	5.6	20	28.9	8.5	60.0
21	134	04.3	. .	57.6	278	50.6	5.7	20	20.4	8.5	60.0
22	149	04.0		57.4	293	15.3	5.8	20	11.9	8.7	60.0
23	164	03.7		57.2	307	40.1	5.8	N20	03.2	8.9	60.0
	SD	16.3	d	0.2	SD		16.1		16.3		16.3

Lat.	Crepúsculo Náutico	Crepúsculo Civil	Orto Sol	Orto Luna 30	Orto Luna 31	Orto Luna 1	Orto Luna 2
°	h m	h m	h m	h m	h m	h m	h m
N 72	08 25	10 46	■	▭	▭	▭	16 28
N 70	08 06	09 51	■	▭	▭	▭	17 27
68	07 50	09 18	■	▭	▭	15 27	18 01
66	07 38	08 54	10 30	▭	14 05	16 19	18 25
64	07 27	08 35	09 51	13 45	15 04	16 51	18 44
62	07 18	08 19	09 24	14 23	15 38	17 15	18 59
60	07 09	08 06	09 03	14 50	16 03	17 34	19 12
N 58	07 02	07 55	08 46	15 11	16 22	17 49	19 23
56	06 56	07 45	08 31	15 29	16 39	18 02	19 33
54	06 50	07 36	08 19	15 43	16 52	18 14	19 41
52	06 44	07 28	08 08	15 56	17 05	18 24	19 49
50	06 39	07 20	07 59	16 08	17 15	18 33	19 56
45	06 27	07 05	07 38	16 31	17 38	18 52	20 10
N 40	06 17	06 51	07 22	16 50	17 56	19 08	20 22
35	06 08	06 40	07 08	17 06	18 11	19 21	20 32
30	06 00	06 29	06 56	17 20	18 24	19 32	20 41
20	05 43	06 11	06 35	17 43	18 46	19 51	20 56
N 10	05 27	05 54	06 16	18 03	19 06	20 08	21 09
0	05 11	05 37	05 59	18 22	19 24	20 24	21 21
S 10	04 52	05 19	05 42	18 41	19 42	20 40	21 33
20	04 30	04 59	05 23	19 02	20 01	20 56	21 46
30	04 01	04 34	05 02	19 25	20 23	21 15	22 01
35	03 43	04 19	04 49	19 39	20 36	21 27	22 10
40	03 20	04 01	04 34	19 55	20 51	21 39	22 20
45	02 50	03 39	04 16	20 14	21 09	21 54	22 31
S 50	02 06	03 10	03 54	20 38	21 31	22 12	22 45
52	01 39	02 55	03 43	20 49	21 42	22 21	22 51
54	00 57	02 38	03 31	21 03	21 53	22 31	22 58
56	////	02 16	03 18	21 18	22 07	22 41	23 06
58	////	01 48	03 01	21 35	22 22	22 54	23 15
S 60	////	01 03	02 41	21 57	22 41	23 08	23 25

Lat.	Ocaso Sol	Crepúsculo Civil	Crepúsculo Náutico	Ocaso Luna 30	Ocaso Luna 31	Ocaso Luna 1	Ocaso Luna 2
°	h m	h m	h m	h m	h m	h m	h m
N 72	■	13 21	15 42	▭	▭	▭	14 05
N 70	■	14 16	16 01	▭	▭	▭	13 05
68	■	14 49	16 16	▭	▭	13 02	12 30
66	13 37	15 13	16 29	▭	12 16	12 09	12 04
64	14 16	15 32	16 39	10 27	11 16	11 36	11 44
62	14 43	15 47	16 49	09 49	10 42	11 12	11 28
60	15 04	16 00	16 57	09 22	10 17	10 52	11 14
N 58	15 21	16 12	17 04	09 01	09 57	10 36	11 02
56	15 35	16 22	17 11	08 43	09 41	10 23	10 52
54	15 47	16 31	17 17	08 29	09 27	10 11	10 43
52	15 58	16 39	17 22	08 16	09 14	10 00	10 35
50	16 08	16 46	17 27	08 05	09 03	09 51	10 27
45	16 28	17 02	17 39	07 41	08 41	09 31	10 11
N 40	16 44	17 15	17 49	07 22	08 22	09 14	09 58
35	16 58	17 26	17 58	07 07	08 07	09 00	09 47
30	17 11	17 37	18 07	06 53	07 53	08 48	09 37
20	17 31	17 55	18 23	06 30	07 30	08 28	09 20
N 10	17 50	18 12	18 39	06 09	07 10	08 10	09 06
0	18 07	18 29	18 55	05 50	06 52	07 53	08 52
S 10	18 24	18 47	19 14	05 32	06 33	07 36	08 37
20	18 43	19 07	19 36	05 11	06 13	07 17	08 22
30	19 04	19 32	20 05	04 48	05 50	06 56	08 05
35	19 17	19 47	20 23	04 34	05 36	06 44	07 54
40	19 32	20 05	20 46	04 18	05 20	06 29	07 43
45	19 50	20 27	21 16	04 00	05 01	06 12	07 29
S 50	20 12	20 56	22 00	03 36	04 37	05 51	07 12
52	20 22	21 10	22 26	03 25	04 26	05 41	07 04
54	20 34	21 28	23 07	03 12	04 13	05 29	06 54
56	20 48	21 49	////	02 57	03 58	05 16	06 44
58	21 04	22 17	////	02 40	03 40	05 01	06 33
S 60	21 24	23 01	////	02 19	03 19	04 42	06 19

Día	SOL E. T. (−) 00h	SOL E. T. (−) 12h	SOL Pas. Mer.	LUNA Pas. Mer. Sup.	LUNA Pas. Mer. Inf.	LUNA Edad	LUNA Fase
d	m s	m s	h m	h m	h m	d	%
30	02 20	02 35	12 03	24 37	12 06	16	100
31	02 49	03 03	12 03	00 37	13 08	17	98
1	03 17	03 32	12 04	01 38	14 08	18	94

EXPLICACIONES

EXPLICACIONES

PRINCIPIO Y DISPOSICIÓN

1. *Objetivo.* El objetivo de este Almanaque es el proporcionar en forma conveniente, los datos necesarios para la práctica de la navegación astronómica en la mar.

2. *Principio.* El contenido principal de éste Almanaque, consiste en datos de los cuales se puede obtener el *Ángulo Horario de Greenwich* (A.H.G.) y la *Declinación* (Dec.) de todos los astros usados en la navegación para cualquier instante del *Tiempo Universal* (T.U.), o *Tiempo Medio de Greenwich* (T.M.G.). El *Ángulo Horario Local* (A.H.L.), puede obtenerse utilizando la siguiente fórmula:

$$\text{A.H.L.} = \text{A.H.G.} \begin{matrix} - \text{ Longitud Oeste} \\ + \text{ Longitud Este} \end{matrix}$$

Los datos restantes consisten en: las horas de Orto y Ocaso del Sol y la Luna, así como la hora de los crepúsculos; datos diversos del calendario y tablas auxiliares, incluyendo una lista de Horas Legales y las correcciones que deben aplicarse a las alturas observadas.

Para el Sol, la Luna y los Planetas los valores del A.H.G. y la Dec. se tabulan directamente para cada hora de T.U. durante todo el año. Para las estrellas se proporciona el *Ángulo Horario Sidéreo* (A.H.S.), y el A.H.G. se obtienen de:

$$\text{A.H.G. Estrella} = \text{A.H.G. de Aries} + \text{A.H.S. de la Estrella}$$

El A.H.S. y la Dec. de las estrellas cambia lentamente y puede considerarse como constante para períodos de varios días. El A.H.G. de Aries, o Ángulo Horario en Greenwich del primer punto de Aries (El Equinoccio de primavera), está tabulado para cada hora. Las tablas en hojas amarillas ofrecen los incrementos y correcciones necesarios para los valores horarios tabulados del A.H.G. y la Dec. para minutos y segundos de T.U.

La serie de seis volúmenes de *Sight Reduction Tables for Marine Navigation* "Tablas de Reducción de Visuales para la Navegación Marítima". (publicados en Estados Unidos de América con el No. 229 y en el Reino Unido con el No. 401), se diseñaron para resolver el triángulo de navegación, usándose junto con *El Almanaque Náutico.*

Existen dos alternativas para el procedimiento de reducción de visuales descritas en las páginas 283 a 327. La primera requiere del uso de calculadoras programables o computadoras personales, mientras que para la segunda se utiliza una serie de tablas concisas que se encuentran en las páginas 295 a 326.

La precisión tabular es de 0′.1 para todos los datos. El argumento del tiempo en las páginas diarias de éste Almanaque es de 12^h + el Ángulo Horario en Greenwich del sol medio y aquí es denotado por T.U., aunque esto se conoce también como T.M.G. Esta escala puede diferir del tiempo transmitido por señales de radio (T.U.C.), por una cantidad tal que si es ignorada puede provocar un error superior de hasta 0′.2 en la longitud determinada por observaciones astronómicas. (La diferencia aparece porque el argumento tiempo, depende de la razón variable de rotación de la Tierra, mientras que las señales de tiempo emitidas por radio están basadas en una escala de tiempo atómico). Se hacen ajustes de un segundo, para las señales de tiempo según se requiera (normalmente a las 24^h del 31 de diciembre y del 30 de junio) para que las diferencias entre las señales de tiempo y el T.U. tal como se usan en éste Almanaque, no excedan de $0^s.9$. Si se requiere reducir estas observaciones a una precisión mejor de 1^s debe obtenerse la corrección para la señal del tiempo (D.T.U.1) del código en dicha señal o bien de otras fuentes; el tiempo requerido esta dado por T.U.1 = T.U.C. + D.T.U.1 con una precisión de $0^s.1$. Alternativamente, la longitud cuando fue determinada por observaciones astronómicas, puede ser corregida por las cantidades correspondientes mostradas en la siguiente tabla.

Corrección a las señales del tiempo	Corrección a la Longitud
$-0^s.9$ a $-0^s.7$	0′.2 al Este
$-0^s.6$ a $-0^s.3$	0′.1 al Este
$-0^s.2$ a $+0^s.2$	no hay corrección
$+0^s.3$ a $+0^s.6$	0′.1 al Oeste
$+0^s.7$ a $+0^s.9$	0′.2 al Oeste

3. *Presentación.* Los datos efeméricos correspondientes a tres días se presentan en la apertura de dos páginas: la página de la izquierda contiene los datos referentes a los planetas y las estrellas; la página de la derecha contiene los datos inherentes al Sol y la Luna, junto con las horas de sus ortos, ocasos y de los crepúsculos.

Los contenidos restantes están ordenados como sigue: para una referencia sencilla, las tablas de corrección de alturas se encuentran en las páginas A_2, A_3, A_4, xxxiv y xxxv; el calendario, fases lunares, eclipses y notas sobre los planetas (por ejemplo, datos de interés general) anteceden a las tabulaciones principales. Las Explicaciones están seguidas por información sobre horas legales, cartas de estrellas y listas de posiciones de las estrellas, procedimientos para reducción de visuales y tablas concisas para reducción de las mismas correcciones e incrementos y otras tablas auxiliares que son usadas frecuentemente.

DATOS PRINCIPALES

4. *Páginas diarias.* En estas páginas se encuentran los valores de A.H.G. de Aries, A.H.G. y Dec. del Sol, la Luna y los cuatro planetas empleados en la navegación, para cada hora de T.U. Para la Luna, también se han tabulado los valores de v y d para cada hora, a fin de facilitar la corrección del A.H.G. y la Dec. para los valores intermedios; los valores v y d correspondientes al Sol y los planetas cambian tan lentamente que se encuentran anotados al pie de las columnas apropiadas, solamente una vez en cada página; v vale cero para Aries, y es despreciable para el Sol por lo que se omite. También se dan los valores de A.H.S. y Dec. correspondientes a las 57 estrellas seleccionadas, dispuestas en orden alfabético, según su nombre propio.

5. *Estrellas.* En las páginas 272–277 se han tabulado los valores mensuales de A.H.S. y Dec. correspondientes a 173 estrellas, incluyendo las 57 seleccionadas; no se necesita interpolación y los datos pueden usarse precisamente en la misma forma que se hace con los referentes a las estrellas seleccionadas en las páginas diarias. Las estrellas se han ordenado de acuerdo a su A.H.S.

La lista de 173 estrellas incluye todas aquellas hasta la magnitud 3.0, junto con algunas menos brillantes para cubrir claros grandes. Las 57 estrellas seleccionadas han sido escogidas según su brillantez y distribución en el cielo; estas serán suficientes para la mayoría de las observaciones.

Las 57 estrellas seleccionadas son conocidas por sus nombres propios, pero también están numeradas en orden descendente de A.H.S. En la lista de 173 estrellas, los nombres de las constelaciones están anotados siempre en la parte izquierda de la página; en dicha pagina, se dan los nombres propios cuando estos son bien conocidos. Los números de las estrellas seleccionadas se anotan en ambas columnas.

En la página xxxiii se encuentra un índice de estrellas seleccionadas, el cual contiene la lista de éstas, tanto en orden alfabético, como numérico; el mismo índice se halla impreso en la hoja suelta adjunta.

6. *Incrementos y Correcciones.* Las tablas impresas en papel de color (páginas ii–xxxi) en la parte posterior del Almanaque, proporcionan los incrementos y correcciones por minutos y segundos, que deben aplicarse a los valores horarios de A.H.G. y Dec. Se componen de sesenta tablas, una por cada minuto, separadas en dos partes: incrementos al A.H.G. para el Sol y los planetas, Aries y Luna para cada minuto y segundo; y, para cada minuto, las correcciones que deben ser aplicadas al A.H.G. y Dec., correspondientes a los valores de v y d dados en las páginas diarias.

Los incrementos están basados en los siguientes rangos de aumento horario adoptados para el A.H.G.: Sol y planetas, 15° exactos; Aries, 15° 02′.46; Luna, 14° 19′.0. Los valores de v anotados en las páginas diarias son los excedentes de los movimientos horarios actuales sobre los valores adoptados; generalmente son positivos, excepto para Venus. Los valores horarios tabulados del A.H.G. para el Sol se han ajustado a fin de reducir a un mínimo el error que se ocasiona al considerar a v como despreciable. Los valores de d consignados en las páginas diarias son las diferencias horarias de la Dec. Para la Luna, se dan los valores verdaderos de v y d para cada hora; en otros casos se dan valores medios para los tres días de cada página.

7. *Método de entrada.* El T.U. correspondiente a una observación se expresa como un día y hora, seguido por un cierto número de minutos y segundos. Por lo tanto, los valores tabulares de A.H.G., Dec. y donde es necesario, los valores correspondientes de v y d, se toman directamente de las páginas diarias para el día y la hora de T.U.; ésta hora es siempre *anterior* a la de observación. Los valores de A.H.S. y Dec. de las estrellas seleccionadas también se toman de las páginas diarias.

A continuación se busca la tabla de incrementos y correcciones correspondiente para el minuto de T.U. Para el A.H.G., el incremento por minutos y segundos se toma de la columna apropiada opuesta al valor de los segundos de T.U.; la corrección v se toma de la segunda parte de la misma tabla opuesta al valor de v dada en las páginas diarias. Tanto el incremento como la corrección v deben agregarse al valor de A.H.G., excepto en el caso de Venus cuando v está antecedida por el signo menos y esta corrección v debe restarse. Para la Dec. no hay incremento, pero se aplica una corrección d en la misma forma que la corrección v; d se encuentra sin signo en la página diaria, por lo que el signo de la corrección debe deducirse por inspección de la columna de Dec. En muchos casos la corrección puede aplicarse mentalmente.

8. *Ejemplos.* (a) Sol y Luna. Determinar el A.H.G. y Dec. del Sol y la Luna para el 24 de agosto del 2001 a las $15^h\ 47^m\ 13^s$ T.U.

		SOL			LUNA			
		A.H.G.	Dec.	d	A.H.G.	v	Dec.	d
		° ′	° ′	′	° ′	′	° ′	′
Página diaria, agosto $24^d\ 15^h$		44 25.6	N 10 56.3	0.9	332 33.9	10.8	S 13 12.0	11.3
Incrementos para	$47^m\ 13^s$	11 48.3			11 16.0			
Corrección por v o d para	47^m		−0.7		+8.6		+8.9	
Suma para	agosto $24^d\ 15^h\ 47^m\ 13^s$	56 13.9	N 10 55.6		343 58.5		S 13 20.9	

(b) Planetas. Determinar el A.H.L. y Dec. de (i) Venus el 24 de agosto del 2001 a las $11^h\ 59^m\ 35^s$ T.U. en longitud de 101° 23′ W; (ii) Marte el 24 de agosto del 2001 a las $17^h\ 49^m\ 36^s$ T.U. en long. 24° 23′ E.

		VENUS				MARTE			
		A.H.G.	v	Dec.	d	A.H.G.	v	Dec.	d
		° ′	′	° ′	′	° ′	′	° ′	′
Página diaria, agosto 24^d	(11^h)	19 03.8	−0.7	N20 23.3	0.4	(17^h) 325 48.3	1.3	S 27 01.6	0.0
Incremento (planetas)	$(59^m\ 35^s)$	14 53.8				$(49^m\ 36^s)$ 12 24.0			
Corrección por v o d	(59^m)	−0.7		−0.4		(49^m) +1.1		+0.0	
Suma = A.H.G. y Dec.		33 56.9		N20 22.9		338 13.4		S 27 01.6	
Longitud	(oeste)	−101 51.0				(este) + 24 23.0			
Múltiplo de 360°		+360				−360			
A.H.L. planeta		292 33.9				2 36.4			

(c) Estrellas. Determinar el A.H.G. y Dec. de (i) *Sirius* el 24 de agosto del 2001 a las $8^h\ 52^m\ 27^s$ T.U.; (ii) *Vega* el 24 de agosto del 2001 a las $23^h\ 12^m\ 57^s$ T.U.

		Sirius			*Vega*	
		A.H.G.	Dec.		A.H.G.	Dec.
		° ′	° ′		° ′	° ′
Página diaria (A.H.S. y Dec.)		258 42.1	S 16 42.9		80 45.0	N 38 47.3
Página diaria (A.H.G. Aries)	(8^h)	92 40.0		(23^h)	318 16.9	
Incremento (Aries)	$(52^m\ 27^s)$	13 08.9		$(12^m\ 57^s)$	3 14.8	
Suma = A.H.G. de la estrella		364 31.0			402 16.7	
Múltiplos de 360°		−360			−360	
A.H.G. de la estrella		4 31.0			42 16.7	

9. *Tablas de la estrella Polar (Polaris).* Las tablas contenidas en las páginas 278-280 dan los valores que permiten deducir la latitud partiendo de una observación de altura de *Polaris,* y también dan su azimut; su empleo se explica e ilustra en dichas páginas. Las tablas están basadas en la fórmula siguiente:

$$\text{Latitud} - H_o = -p\cos h + \tfrac{1}{2}\,p\,\operatorname{sen} p\,\operatorname{sen}^2 h\,\tan(\text{latitud})$$

En donde:

H_o = Altura aparente (corregida por refracción)
p = distancia polar de *Polaris* = 90° − Dec.
h = ángulo horario local de *Polaris* = A.H.L. Aries + A.H.S.

a_0, que es una función de A.H.L. de Aries únicamente, es el valor de ambos términos de la fórmula anterior calculada para valores medios de A.H.S. (321° 41′) y Dec. (89° 16′.2 N) de *Polaris*, para una latitud media de 50°, y ajustada con la adición de una constante de (58′.8).

a_1, la cual es una función de A.H.L. de Aries y la latitud, es el exceso del valor del segundo término sobre su valor medio para una latitud de 50°, incrementado por una constante (0′.6) a fin de hacerlo siempre positivo. a_2, la cual es una función del A.H.L. de Aries y de la fecha, es la corrección aplicable al primer término por la variación de *Polaris* a partir de su posición media adoptada; este valor está incrementado por una constante (0′.6) a fin de hacerlo positivo. La suma de las constantes agregadas es 1°, de tal manera que:

$$\text{Latitud} = \text{Altura aparente (corregida por refracción)} - 1° + a_0 + a_1 + a_2$$

FENÓMENOS DE ORTO Y OCASO

10. *Generalidades.* En el lado derecho de las páginas diarias se encuentran anotadas las horas de orto y ocaso del Sol, las de inicio y fin de los crepúsculos civil y náutico y las de orto y ocaso de la Luna para latitudes comprendidas entre 72° N y 60° S. Estas horas se encuentran dadas al minuto próximo, y son estrictamente los T.U. en que ocurre el fenómeno sobre el meridiano de Greenwich; están dadas para cada día, para orto y ocaso de la Luna, pero solamente para el día medio de los tres contenidos en cada página para el caso del fenómeno solar.

Estas horas son aproximadamente los Tiempos Medios Locales (T.M.L.) del fenómeno correspondiente sobre otros meridianos y pueden interpolarse formalmente si se desea. El T.U. de ocurrencia de un fenómeno se obtiene a partir del T.M.L. por medio de la siguiente fórmula:

$$\text{T.U.} = \text{T.M.L.} \begin{matrix} + \text{ Longitud Oeste} \\ - \text{ Longitud Este} \end{matrix}$$

en la cual la longitud debe ser primeramente transformada a tiempo por la tabla en la página i o de otra forma.

La interpolación para la latitud puede hacerse mentalmente o con ayuda de la tabla I de la página xxxii.

Para indicar las condiciones bajo las cuales algunos de los fenómenos no ocurren en altas latitudes, se usan los símbolos siguientes:

☐ El Sol o la Luna permanecen continuamente sobre el horizonte;
■ El Sol o la Luna permanecen continuamente por debajo del horizonte;
//// El crepúsculo dura toda la noche.

Bases de las tabulaciones. Para el orto y el ocaso del Sol se adoptan los valores de 16′ por semi-diámetro y 34′ por refracción horizontal, de tal manera que a las horas dadas el limbo superior del Sol se encuentra sobre el horizonte visible; todas las horas se refieren al fenómeno tal como se ve desde el nivel del mar con horizonte claro.

A las horas dadas para comienzo y final de los crepúsculos, la distancia cenital del Sol es de 96° para el civil, y de 102° para el náutico. El grado de iluminación a las horas dadas para el crepúsculo civil (en buenas condiciones y en ausencia de otra iluminación) es tal que las estrellas más brillantes resultan visibles y el horizonte claramente definido. A las horas dadas por el crepúsculo náutico el horizonte por regla general, no resulta visible y está demasiado obscuro para efectuar alguna observación con el sextante marino.

Las horas correspondientes para otras depresiones del Sol pueden ser obtenidas por interpolación o, para depresiones de más de 12° y con menos confiabilidad por extrapolación; las horas así obtenidas pueden sujetarse a considerable incertidumbre, cerca de condiciones extremas.

Para el orto y el ocaso de la Luna se adopta el valor de (34′), por semi-diámetro, paralaje y refracción de tal manera que a las horas dadas, el limbo superior de la Luna se encuentre sobre el horizonte visible, tal como se ve desde el nivel del mar.

11. *Crepúsculo, orto y ocaso del Sol.* Las horas tabuladas pueden considerarse sin errores serios, como el T.M.L. de ocurrencia del fenómeno, en cualquiera de los tres días contenidos en la página y en cualquier longitud. Las horas precisas pueden obtenerse normalmente interpolando los valores tabulares por latitud y de acuerdo con el día y longitud correctos, considerando a esta última expresada como fracción de un día dividiendo su valor entre 360°, positiva para las longitudes oestes y negativas para las estes. En las condiciones extremas, cerca de los símbolos □, ■ o ////, puede no ser posible la interpolación en una dirección, pero los valores exactos son de escasa significación en estas circunstancias.

Ejemplo. Determinar el T.U. de (a) al inicio del crepúsculo matutino y el orto del Sol el 22 de enero del 2001 para una latitud de 48° 55′ S y longitud de 75° 18′ E; (b) el ocaso del Sol y el fin del crepúsculo vespertino el 24 de enero del 2001 para una latitud de 67° 10′ N y longitud de 168° 05′ W.

		Crepúsculo		Orto		Ocaso	Crepúsculo	
	(a)	Náutico	Civil		(b)		Civil	Náutico
De la página 25		d h m	d h m	d h m		d h m	d h m	d h m
T.M.L. para Lat.	S 45°	22 03 25	22 04 09	22 04 43	N 66°	24 14 58	24 16 08	24 17 15
Corr. para	S 48° 55′	−23	−20	−16	N 67° 10′	−17	−9	−6
(p. xxxii, Tabla I)								
Long. (pág. i)	E 75° 18′	−5 01	−5 01	−5 01	W 168° 05′	+11 12	+11 12	+11 12
T.U.		21 22 01	21 22 48	21 23 27		25 01 53	25 03 11	25 04 21

Los T.M.L. son estrictamente para el 23 de enero (fecha media de la página) y 0° de longitud; para obtener la hora precisa es necesario interpolar, pero los errores de redondeo pueden acumular hasta 2^m aprox.

a) para enero $22^d - 75° / 360° =$ enero $21^d.8$, es decir $\frac{1}{3}(1.2) = 0.4$, respecto a los datos anteriores en la misma latitud interpolados en la misma forma según la página 23; las correcciones son -4^m en el crepúsculo náutico, -2^m en el crepúsculo civil y -2^m al orto del Sol.

b) para enero $24^d + 168° / 360° =$ ene. $24^d.5$, es decir $\frac{1}{3}(1.5) = 0.5$ respecto a los datos posteriores en la misma latitud e interpolados en la misma forma, según la página 27, las correcciones son $+7^m$ al ocaso del Sol, en los crepúsculos civil $+5^m$ y para el náutico $+6^m$.

12. *Orto y ocaso de la Luna.* Raramente se necesitan las horas precisas de orto y ocaso de la Luna; una mirada a las tablas generalmente dará suficiente indicación acerca de si la Luna se encuentra en condiciones de observación y de las horas de su orto y ocaso. De ser necesario, las horas precisas pueden obtenerse como sigue: Interpolar por latitud, usando la tabla I de la página xxxii, para el día deseado y también para el día anterior en longitudes este, o para el día siguiente en longitudes oeste; tomar la diferencia entre estas horas e interpolar por longitud aplicando a la hora del día deseado la corrección de la Tabla II de la página xxxii, de tal manera que la hora resultante queda entre las dos horas usadas. En condiciones extremas cerca de los símbolos □ o ■, la interpolación por latitud o longitud solamente es posible en una dirección; en estas circunstancias las horas exactas son de escaso valor.

Para facilitar esta interpolación en cada página se encuentran registradas las horas de orto y ocaso de Luna para cuatro días en cada página; cuando no hay ocurrencia del fenómeno durante un día particular (tal como

acontece una vez al mes), se proporciona la hora de ocurrencia del fenómeno para el día siguiente, aumentada en 24^h; debe tenerse mucho cuidado al interpolar entre dos valores cuando uno de estos excede de 24^h. En la práctica es suficiente emplear la diferencia diaria entre las horas para la latitud más próxima tabulada y generalmente entrar a la tabla II con los argumentos tabulares más próximos, tal como se muestra en los ejemplos que siguen:

Ejemplos. Determinar el orto y ocaso de la luna en latitud 47° 10′ S, longitudes 124° 00′ E y 78° 31′ W el 30 de enero del 2001.

	Longitud 124° 00′ E		Longitud 78° 31′ W	
	Orto	Ocaso	Orto	Ocaso
	d h m	d h m	d h m	d h m
T.M.L. para Lat. 45° S	30 10 31	30 22 32	30 10 31	30 22 32
Corr. por Lat. (pág. xxxii, Tabla I)	+00	−02	+00	−02
Corr. por Long. (pág. xxxii, Tabla II)	−23	−07	+16	+07
T.M.L. Corregido	30 10 08	30 22 23	30 10 47	30 22 37
Longitud (pág. i)	−8 16	−8 16	+5 14	+5 14
T.U.	30 01 52	30 14 07	30 16 01	31 03 51

TABLAS DE CORRECCIÓN DE ALTURAS

13. *Generalidades.* En general se dan dos correcciones para aplicarse a las alturas observadas con el sextante marino; se necesitan correcciones adicionales para Venus y Marte y también para alturas muy bajas.

En las páginas A_2 y xxxiv, están dadas las tablas de corrección por depresión del horizonte, debido a la altura del ojo del observador sobre el nivel del mar. Estrictamente esta corrección debe aplicarse primero y restarse de la altura del sextante, para obtener la altura aparente, que es el argumento de entrada correcto para las otras tablas.

Se dan tablas separadas para obtener la segunda corrección para el Sol, estrellas y planetas (en las páginas A_2 y A_3), y para la Luna (en las páginas xxxiv y xxxv). Para el Sol, se dan los valores para ambos limbos, superior e inferior, para dos períodos del año. Las tablas de estrellas se usan para planetas, pero se necesita hacer correcciones adicionales por paralaje para Venus y Marte (página A_2). Las tablas para la Luna están divididas en dos partes; la corrección principal es una función de la altura aparente únicamente y está tabulada para el limbo inferior (deben restarse 30′ para obtener la corrección del limbo superior); la otra, que viene dada tanto para limbo superior como para inferior, depende también del paralaje horizontal, que debe tomarse de las páginas diarias.

Se necesita también, una corrección adicional consignada en la página A_4, para el cambio en la refracción, debida a variaciones de presión y temperatura a partir de las condiciones normales adoptadas; ésta puede ignorarse generalmente, para alturas mayores de 10°, excepto posiblemente, en condiciones extremas. Las tablas de correcciones para Sol, estrellas y planetas, están presentadas en dos partes; solamente aquellas referentes a alturas mayores de 10° se han reimpreso en la hoja suelta adjunta.

14. *Tablas críticas.* Algunas de las tablas de correcciones de altura se han dispuesto como tablas críticas. En éstas, un intervalo de altura aparente (o altura de ojo del observador) corresponde a un solo valor de la corrección; no se necesita interpolación. Para una entrada "crítica" se toma el valor superior de los dos posibles para la corrección. Por ejemplo en la tabla de depresión, una corrección de −4′.1 corresponde a todos los valores de altura del ojo de 5.3 a 5.5 metros (17.5 a 18.3 pies) inclusive.

15. *Ejemplos.* Los siguientes ejemplos ilustran el uso de las tablas de corrección de alturas; se asume que las alturas del sextante fueron tomadas para el 24 de agosto del 2001 con un sextante marino a una altura de 5.4 m (18 pies), temperatura de −3° C y una presión de 982 mb, las visuales a la Luna fueron tomadas alrededor de las 10^h T.U.

	SOL limbo inf.	SOL limbo sup.	LUNA limbo inf.	LUNA limbo sup.	VENUS	*Polaris*
	° ′	° ′	° ′	° ′	° ′	° ′
Altitud del sextante	21 19.7	3 20.2	33 27.6	26 06.7	4 32.6	49 36.5
Depresión 5.4 m (18 pies)	−4.1	−4.1	−4.1	−4.1	−4.1	−4.1
Corrección principal	+13.8	−29.4	+57.4	+60.5	−10.8	−0.8
−30′ Limbo sup. de la (Luna)	—	—	—	−30.0	—	—
Corr. para la Luna (Limbos)	—	—	+5.5	+3.8	—	—
Corr. adicional para Venus	—	—	—	—	+0.1	—
Corr. adicional por refracción	−0.1	−0.3	0.0	−0.1	−0.3	0.0
Altitud del sextante corregida	21 29.1	2 46.4	34 26.4	26 36.8	4 17.5	49 31.6

Las correcciones principales se han obtenido partiendo de la altitud aparente (altitud de sextante corregida por depresión) como argumento, interpolando donde fue posible. Estos refinamientos raramente se necesitan.

16. *Bases de las correcciones.* La tabla por depresión de horizonte del mar está basada en la fórmula:

$$\text{Corrección por dep.} = -1'.76\sqrt{(\text{altura del ojo en metros})} = -0'.97\sqrt{(\text{altura del ojo en pies})}$$

La tabla de corrección para el Sol incluye los efectos de semi-diámetro, paralaje y refracción media.

Las tablas de corrección para estrellas y planetas se aplican para el efecto de refracción media.

La corrección por fase para Venus, ha sido incorporada en las tabulaciones por A.H.G. y Dec., y no se requiere corrección por fase. Las correcciones adicionales para Venus y Marte, toman en cuenta el paralaje. Alternativamente, la corrección por paralaje puede ser calculada por p cos H, donde p es el paralaje y H es la altitud. En el 2001 los valores para p son:

	1 ene.	30 ene.	23 feb.	11 mar.	16 abr.	2 mayo	24 mayo	13 jul.	31 dic.
Venus	0′.2	0′.3	0′.4	0′.5	0′.4	0′.3	0′.2	0′.1	
	1 ene.	23 mar.	11 mayo	8 ago.	17 oct.	31 dic.			
Marte	0′.1	0′.2	0′.3	0′.2	0′.1				

La tabla de corrección para la Luna incluye los efectos de semi-diámetro, paralaje, aumento y refracción media.

La refracción media se calcula para una temperatura de 10° C (50° F) y una presión de 1010 mb. (29.83 pulgadas).

17. *Observaciones con sextante de burbuja.* Cuando se observa con sextante de burbuja no son necesarias las correcciones por depresión, semi-diámetro o aumento. Las correcciones de altura para las estrellas y planetas en la página A_2 y en la hoja suelta, deberán ser usadas tanto para el Sol como para las estrellas y planetas; para la Luna es más fácil tomar el promedio de las correcciones para los Limbos inferior y superior y restar 15′ de la altitud; la corrección por depresión no debe ser aplicada.

DATOS AUXILIARES Y DE PLANEACIÓN

18. *Sol y Luna.* En las páginas diarias se encuentran anotados los valores horarios del paralaje horizontal de la Luna; los semi-diámetros y las horas de paso por el Meridiano de Greenwich tanto del Sol como de la Luna; la ecuación del tiempo; la edad de la Luna, el porcentaje iluminado (%), y un símbolo indicativo de su fase. Las horas de las fases de la Luna se dan en T.U. en la página 4. Para la Luna, se encuentran los valores de los semi-diámetros para cada uno de los tres días al pie de la columna; para el Sol es suficiente un solo valor. La Tabla II de la página xxxii puede usarse para interpolar la hora de paso de la Luna por el meridiano para su longitud. La ecuación del tiempo (E.T.), esta dada diariamente, para las 00^h y 12^h de T.U. El signo es *positivo* para valores no sombreados y *negativo* para los sombreados. Para obtener la hora verdadera sumar la ecuación del tiempo de la hora media cuando el signo es *positivo*. Restar la ecuación del tiempo de la hora media cuando el signo es *negativo*. A las 12^h T.U., cuando el signo es *positivo* el paso del Sol por el meridiano ocurre *antes* de las 12^h T.U., de otra manera ocurre *después* de las 12^h T.U.

EXPLICACIONES

19. *Planetas.* Las magnitudes de los planetas están asentadas siguiendo inmediatamente a sus nombres en los encabezados de las páginas diarias; también están dadas para el día medio de los tres de cada página, sus A.H.S. a las 00^h T.U. y sus horas de paso por el meridiano.

Las notas y diagramas sobre planetas contenidas en las páginas 8 y 9 proporcionan una información descriptiva acerca de la posibilidad de observación de los planetas durante el año, así como de sus posiciones y movimientos.

20. *Estrellas.* En las páginas diarias se anota la hora del paso por el meridiano de Greenwich del primer punto de Aries para el día medio de los tres contenidos en cada página, hasta $0^m.1$. El intervalo entre pasos sucesivos por el meridiano es de $23^h\ 56^m.1$ (24^h menos $3^m.9$) de tal manera que pueden deducirse rápidamente las horas de paso correspondientes a días intermedios, así como las de paso por otros meridianos. Si se necesita la hora precisa esta puede determinarse encontrando el T.U. al cual corresponde un valor cero para el A.H.L. de Aries.

El paso de una estrella por el meridiano ocurre cuando su A.H.L. vale cero, esto es cuando A.H.L. de Aries + A.H.S. = 360°. Se puede obtener una hora aproximada empleando el diagrama de planetas de la página 9.

Las cartas de estrellas que se muestran en las páginas 270–271 sirven como ayuda en su identificación. Estas cartas muestran la posición relativa de las estrellas en el cielo tal como se ven desde la tierra e incluyen las 173 estrellas empleadas en el Almanaque, junto con otras más para completar la configuración de las constelaciones principales. El meridiano local puede colocarse a cualquier hora en la carta por medio de su A.H.S., el cual es igual a 360° – A.H.L. de Aries, o Longitud Oeste – A.H.G. de Aries.

21. *Esfera Celeste.* Para emplear la escala A.H.L. de Aries, impresa en una esfera celeste, primero se fija la esfera de acuerdo con la latitud y luego se hace girar alrededor del eje polar, hasta que se lea el A.H.L. de Aries en la escala bajo el borde del círculo meridiano.

Para encontrar las posiciones del Sol, la Luna y los planetas sobre una esfera celeste tómese la diferencia A.H.G. de Aries – A.H.G. del astro y úsese esta diferencia a lo largo de la escala de A.H.L. de Aries conjuntamente con la declinación, para plotear la posición del astro. Es más conveniente tomar la diferencia A.H.G. de Aries – A.H.G. del astro cuando el A.H.G. del astro es pequeño (menos de 15°), lo cual acontece una vez al día.

22. *Calendario.* En la página 4 se encuentran listas de festividades, aniversarios y fases de la Luna. El calendario de la página 5, incluye el orden numérico progresivo de los días del año y del mes, así como el nombre correspondiente de los días de la semana.

Al pie de la página 5 se consignan notas breves acerca de los eclipses solares y lunares que ocurren durante el año; las horas anotadas están expresadas en términos de T.U. Las características principales de los eclipses del Sol más importantes se muestran en los mapas de las páginas 6 y 7.

23. *Horas legales.* Las listas de las páginas 266–269 dan las horas legales usadas en la mayoría de los países. En general no se ha intentado dar detalles acerca del inicio y término de la hora de verano, debido a que están sujetas a cambios frecuentes sin que se avise con antelación suficiente.

La línea internacional de la fecha es una línea arbitraria que determina una diferencia de un día entre cada uno de sus lados; cuando se cruza esta línea en rumbo hacia el oeste, la fecha debe adelantarse un día; cuando se cruza el rumbo al este la fecha debe atrasarse un día. Esta línea es una modificación de la correspondiente al meridiano de 180° y se ha trazado de modo que incluya hasta donde sea posible, islas de un mismo grupo, etc., hacia un mismo lado de la línea. Puede trazarse comenzando en el Polo Sur y uniendo los siguientes puntos.

	°	°	°	°	°	°	°
Lat.	S 51.0	S 45.0	S 15.0	S 5.0	N 48.0	N 53.0	N 65.5
Long.	180.0	W 172.5	W 172.5	180.0	180.0	E 170.0	W 169.0

de ahí dividiendo las islas Diómedes, llega hasta la Lat. 68°.0 N, Long. 169°.0 W, pasando al Este de Ostrov Vrangelya (Isla Wrangel) en Lat. 75°.0 N, Long 180°.0, y después hacia el Polo Norte.

EXACTITUD

24. *Datos principales.* Las cantidades tabuladas de este Almanaque son generalmente correctas al 0′.1 más próximo; la excepción la constituye el A.H.G. del Sol, el cual está ajustado deliberadamente por arriba de 0′.15 a fin de reducir el error cometido al pasar por alto la corrección *v*. El A.H.G. y la Dec., para horas intermedias no pueden obtenerse con esta precisión, ya que deben agregarse al menos dos cantidades; más aún, las correcciones de *v* y *d* están basadas en valores medios de *v* y *d*, se toman de las tablas al minuto cerrado solamente. El error más grande que puede ocurrir en el A.H.G. o la Dec. de cualquier astro diferente del Sol o la Luna, es menor que 0′.2; puede llegar 0′.25 para el A.H.G. del Sol y a 0′.3 para el de la Luna.

En la práctica puede esperarse que solamente una tercera parte de los valores tomados del A.H.G. y la Dec., tengan errores mayores de 0′.05 y menos de una décima parte tengan errores mayores de 0′.1.

25. *Correcciones a las altitudes.* Los errores en las correcciones de las alturas son nominalmente del mismo orden que los correspondientes al A.H.G. y la Dec., puesto de que son el resultado de sumar varias cantidades, cada una de las cuales se ha redondeado correctamente al 0′.1. En caso de condiciones atmosféricas extremas, los valores reales de la depresión y de la refracción a bajas alturas, pueden diferir considerablemente de los valores medios empleados en las tablas.

UTILIDAD Y USO DE ESTE ALMANAQUE EN EL 2002

Este Almanaque puede ser usado para el Sol y las estrellas en el 2002 de la siguiente manera.

Para el Sol, asumir el A.H.G. y la Dec. para la misma fecha, pero para la hora $5^h\ 48^m\ 00^s$ *más temprano* que el T.U. de observación; agregar 87° 00′ a el A.H.G. así obtenido. El error, debido principalmente a las perturbaciones planetarias de la Tierra, es poco probable que exceda 0′.4.

Para las estrellas, calcular el A.H.G. y la Dec. para la misma fechas y periodos, pero *restar* 15′.1 al A.H.G. encontrado. El error debido a la corrección incompleta para la precesión y nutación es poco probable que exceda de 0′.4. Si se prefiere, el mismo resultado puede obtenerse usando un periodo de $5^h\ 48^m\ 00^s$ mas temprano, que el T.U. de observación (como para el Sol) y sumando 86° 59′.2 al A.H.G. (o sumando 87° como para el Sol y restando 0′.8, por precesión, del A.H.S. de la estrella).

El Almanaque no puede ser usado para la Luna o los planetas.

HORAS LEGALES (Corregidas hasta octubre de 1999)

LISTA I LUGAR CON HORA ADELANTADA AL T.U.C.

(principalmente en aquellos al ESTE DE GREENWICH)

Las horas dadas abajo deben *sumarse* al T.U.C. para obtener Hora Legal / *restarse* de la Hora Legal para dar T.U.C.

	h	m
Admiralty Islands	10	
Afghanistan	04	30
Albania*	01	
Algeria	01	
Amirante Islands	04	
Andaman Islands	05	30
Angola	01	
Armenia*	04	
Australia		
Australian Capital Territory*	10	
New South Wales[1]*	10	
Northern Territory	09	30
Queensland	10	
South Australia*	09	30
Tasmania*	10	
Victoria*	10	
Western Australia	08	
Whitsunday Islands	10	
Austria*†	01	
Azerbaijan*	04	
Bahrain	03	
Balearic Islands*	01	
Bangladesh	06	
Belarus*	02	
Belgium*†	01	
Benin	01	
Bosnia and Herzegovina*	01	
Botswana, Republic of	02	
Brunei	08	
Bulgaria*	02	
Burma (Myanmar)	06	30
Burundi	02	
Cambodia	07	
Cameroon Republic	01	
Caroline Islands[2]	10	
Central African Republic	01	
Chad	01	
Chagos Archipelago,	05	
Diego Garcia	06	
Chatham Islands*	12	45
China, People's Republic of	08	
Christmas Island, Indian Ocean	07	
Cocos (Keeling) Islands	06	30
Comoro Islands (Comoros)	03	
Congo, Democratic Republic		
Kinshasa, Mbandaka	01	
Haut-Zaire, Kasai, Kivu, Shaba	02	
Congo Republic	01	
Corsica*	01	
Crete*	02	
Croatia*	01	
Cyprus: Ercan*, Larnaca*	02	
Czech Republic*	01	

	h	m
Denmark*†	01	
Djibouti	03	
Egypt, Arab Republic of*	02	
Equatorial Guinea, Republic of	01	
Eritrea	03	
Estonia*	02	
Ethiopia	03	
Fiji*	12	
Finland*†	02	
France*†	01	
Gabon	01	
Georgia*	04	
Germany*†	01	
Gibraltar*	01	
Greece*†	02	
Guam	10	
Hong Kong	08	
Hungary*	01	
India	05	30
Indonesia, Republic of		
Bangka, Billiton, Java, West and Central Kalimantan, Madura, Sumatra	07	
Bali, Flores, South and East Kalimantan, Lombok, Sulawesi, Sumba, Sumbawa, Timor	08	
Aru, Irian Jaya, Kai, Moluccas, Tanimbar	09	
Iran*	03	30
Iraq*	03	
Israel*	02	
Italy*†	01	
Jan Mayen Island*	01	
Japan	09	
Jordan	02	
Kazakhstan*		
Western, Aktau, Uralsk, Atyrau	04	
Central, Aktyubinsk, Kzyl-Orda	05	
Eastern	06	
Kenya	03	
Kiribati Republic		
Gilbert Islands	12	
Phoenix Islands	13	
Line Islands[3]	14	
Korea, North,	09	
Republic of (South)	09	
Kuril Islands	11	
Kuwait	03	
Kyrgyzstan*	05	
Laccadive Islands	05	30
Laos	07	
Latvia*	02	

* La hora de verano puede conservarse en estos lugares. † Para los datos de la hora de verano ver Lista II notas al pie.

1 Excepto el área de Broken Hill, la cual conserva $09^h\ 30^m$.

2 Excepto Pohnpei, Pingelap y Kosrae las cuales conservan 11^h.

3 Las Line Islands que son parte de la República Kiribati conservan 10^h de atraso al T.U.C.

LISTA I — (*continua*)

	h	m
Lebanon*	02	
Lesotho	02	
Libya	02	
Liechtenstein*	01	
Lithuania*	02	
Lord Howe Island*	10	30
Luxembourg*†	01	
Macau	08	
Macedonia*, former Yugoslav Republic	01	
Macias Nguema (Fernando Póo)	01	
Madagascar, Democratic Republic of	03	
Malawi	02	
Malaysia, Malaya, Sabah, Sarawak	08	
Maldives, Republic of The	05	
Malta*	01	
Mariana Islands	10	
Marshall Islands[1]	12	
Mauritius	04	
Moldova*	02	
Monaco*	01	
Mongolia	08	
Mozambique	02	
Namibia*	01	
Nauru	12	
Nepal	05	45
Netherlands, The*†	01	
New Caledonia	11	
New Zealand*	12	
Nicobar Islands	05	30
Niger	01	
Nigeria, Republic of	01	
Norfolk Island	11	30
Norway*	01	
Novaya Zemlya	03	
Okinawa	09	
Oman	04	
Pagalu (Annobon Islands)	01	
Pakistan	05	
Palau Islands	09	
Papua New Guinea	10	
Pescadores Islands	08	
Philippine Republic	08	
Poland*	01	
Qatar	03	
Reunion	04	
Romania*	02	
Russia[2]*		
Zone 1 Kaliningrad	02	
Zone 2 Moscow, St Petersburg, Arkhangelsk, Astrakhan	03	
Zone 3 Samara, Izhevsk	04	
Zone 4 Perm, Amderna, Novyy Port	05	
Zone 5 Omsk, Novosibirsk	06	
Zone 6 Norilsk, Kyzyl, Dikson	07	
Russia (*continued*)		
Zone 7 Bratsk, Irkutsk, Ulan-Ude	08	
Zone 8 Yakutsk, Chita, Tiksi	09	
Zone 9 Vladivostok, Khabarovsk, Okhotsk	10	
Zone 10 Magadan, Yuzhno	11	
Zone 11 Petropavlovsk, Pevek	12	
Rwanda	02	
Ryukyu Islands	09	
Sakhalin Island*	10	
Santa Cruz Islands	11	
Sardinia*	01	
Saudi Arabia	03	
Schouten Islands	10	
Serbia*	01	
Seychelles	04	
Sicily*	01	
Singapore	08	
Slovakia*	01	
Slovenia*	01	
Socotra	03	
Solomon Islands	11	
Somalia Republic	03	
South Africa, Republic of	02	
Spain*†	01	
Spanish Possessions in North Africa*	01	
Spitsbergen (Svalbard)*	01	
Sri Lanka	06	
Sudan, Republic of	02	
Swaziland	02	
Sweden*†	01	
Switzerland*	01	
Syria (Syrian Arab Republic)*	02	
Taiwan	08	
Tajikistan	05	
Tanzania	03	
Thailand	07	
Tonga	13	
Tunisia	01	
Turkey*	02	
Turkmenistan	05	
Tuvalu	12	
Uganda	03	
Ukraine*	02	
United Arab Emirates	04	
Uzbekistan	05	
Vanuatu, Republic of	11	
Vietnam, Socialist Republic of	07	
Yemen	03	
Yugoslavia*, Federal Republic of	01	
Zambia, Republic of	02	
Zimbabwe	02	

* La hora de verano puede conservarse en estos lugares. † Para los datos de la hora de verano ver Lista II notas al pie.

[1] Excepto el Atolón Ebon que conserva 24^h de atraso del resto de las islas.

[2] Las fronteras entre las zonas son irregulares; el listado son ciudades principales en cada zona.

LISTA II - LUGARES QUE MANTIEN NORMALMENTE T.U.C.

Ascension Island	Ghana	Irish Republic*†	Morocco	Sierra Leone
Burkina-Faso	Great Britain†	Ivory Coast	Portugal*†	Togo Republic
Canary Islands*	Guinea-Bissau	Liberia	Principe	Tristan da Cunha
Channel Islands†	Guinea Republic	Madeira*	St. Helena	
Faeroes*, The	Iceland	Mali	São Tomé	
Gambia, The	Ireland, Northern†	Mauritania	Senegal	

* La hora de verano puede conservarse en estos lugares.

† La directiva de los estados de la Unión Europea establece que la hora de verano, se adelante una hora al T.U.C., se conserve desde el $25^{d}01^{h}$ de marzo al $28^{d}01^{h}$ de octubre T.U.C. del año 2001.

LISTA III - LUGARES CON HORAS ATRASADAS AL T.U.C. (OESTE DE GREENWICH)

Las horas dadas abajo deben *restarse* al T.U.C. para obtener Hora Legal
Las horas dadas abajo deben *sumarse* a la hora Legal para obtener T.U.C.

	h	m
Argentina	03	
Austral (Tubuai) Islands[1]	10	
Azores*	01	
Bahamas*	05	
Barbados	04	
Belize	06	
Bermuda*	04	
Bolivia	04	
Brazil		
S and E coastal states, Bahia, Goiás, Brasilia*	03	
N and NE coastal states, Eastern Para	03	
Mato Grosso, Mato Grosso do Sul*	04	
Central states, western Para, E and Central Amazonas	04	
Territory of Acre, western Amazonas	05	
British Antarctic Territory[2]	03	
Canada		
Alberta*	07	
British Columbia[3]*	08	
Labrador[3]*	04	
Manitoba*	06	
New Brunswick*	04	
Newfoundland*	03	30
Northwest Territories[3]*		
east of long. W. 85°	05	
long. W. 85° to W. 102°	06	
west of long. W. 102°	07	
Nova Scotia*	04	
Ontario, east of long. W. 90°*	05	
west of long. W. 90°*	06	
Prince Edward Island*	04	
Canada (*continued*)		
Quebec, east of long. W. 63°[3]	04	
west of long. W. 63°*	05	
Saskatchewan[3]	06	
Yukon*	08	
Cape Verde Islands	01	
Cayman Islands	05	
Chile*	04	
Colombia	05	
Cook Islands	10	
Costa Rica	06	
Cuba*	05	
Curaçao Island	04	
Dominican Republic	04	
Easter Island (I. de Pascua)*	06	
Ecuador	05	
El Salvador	06	
Falkland Islands*	04	
Fanning Island	10	
Fernando de Noronha Island	02	
French Guiana	03	
Galápagos Islands	06	
Greenland[4]		
General*	03	
Scoresby Sound*	01	
Thule area*	04	
Grenada	04	
Guadeloupe	04	
Guatemala	06	
Guyana, Republic of	04	
Haiti	05	
Honduras	06	

* La hora de verano puede conservarse en estos lugares.

1 Esta es la hora legal, pero generalmente se usa el tiempo medio local.

2 La mayoría de estaciones usan el T.U.C.

3 Algunas áreas pueden conservar otra zona de tiempo.

4 Mester Vig y Danmarkshavn conservan el T.U.C.

LISTA III - (*continua*)

	h	m
Jamaica	05	
Johnston Island	10	
Juan Fernandez Islands*	04	
Leeward Islands	04	
Marquesas Islands	09	30
Martinique	04	
Mexico*[1]	06	
Midway Islands	11	
Nicaragua	06	
Niue	11	
Panama, Republic of	05	
Paraguay*	04	
Peru	05	
Puerto Rico	04	
St. Pierre and Miquelon*	03	
Samoa	11	
Society Islands	10	
South Georgia	02	
Suriname	03	
Trindade Island, South Atlantic	02	
Trinidad and Tobago	04	
Tuamotu Archipelago	10	
Tubuai (Austral) Islands	10	
Turks and Caicos Islands*	05	
United States of America[2]		
Alabama	06	
Alaska	09	
Aleutian Islands, east of W. 169° 30′	09	
Aleutian Islands, west of W. 169° 30′	10	
Arizona[3]	07	
Arkansas	06	
California	08	
Colorado	07	
Connecticut	05	
Delaware	05	
District of Columbia	05	
Florida[4]	05	
Georgia	05	
Hawaii[3]	10	
Idaho[4]	07	
Illinois	06	
Indiana[3,4]	05	

	h	m
United States of America[2] (*continued*)		
Iowa	06	
Kansas[4]	06	
Kentucky, eastern part	05	
western part	06	
Louisiana	06	
Maine	05	
Maryland	05	
Massachusetts	05	
Michigan[4]	05	
Minnesota	06	
Mississippi	06	
Missouri	06	
Montana	07	
Nebraska, eastern part	06	
western part	07	
Nevada	08	
New Hampshire	05	
New Jersey	05	
New Mexico	07	
New York	05	
North Carolina	05	
North Dakota[4]	06	
Ohio	05	
Oklahoma	06	
Oregon[4]	08	
Pennsylvania	05	
Rhode Island	05	
South Carolina	05	
South Dakota, eastern part	06	
western part	07	
Tennessee, eastern part	05	
western part	06	
Texas[4]	06	
Utah	07	
Vermont	05	
Virginia	05	
Washington D.C.	05	
Washington	08	
West Virginia	05	
Wisconsin	06	
Wyoming	07	
Uruguay	03	
Venezuela	04	
Virgin Islands	04	
Windward Islands	04	

* La hora de verano puede conservarse en estos países.

1 Excepto los estados de Sonora, Sinaloa*, Nayarit* y el estado de Baja California Sur* que conservan 07^h, y el estado de Baja California Norte* que conserva 08^h.

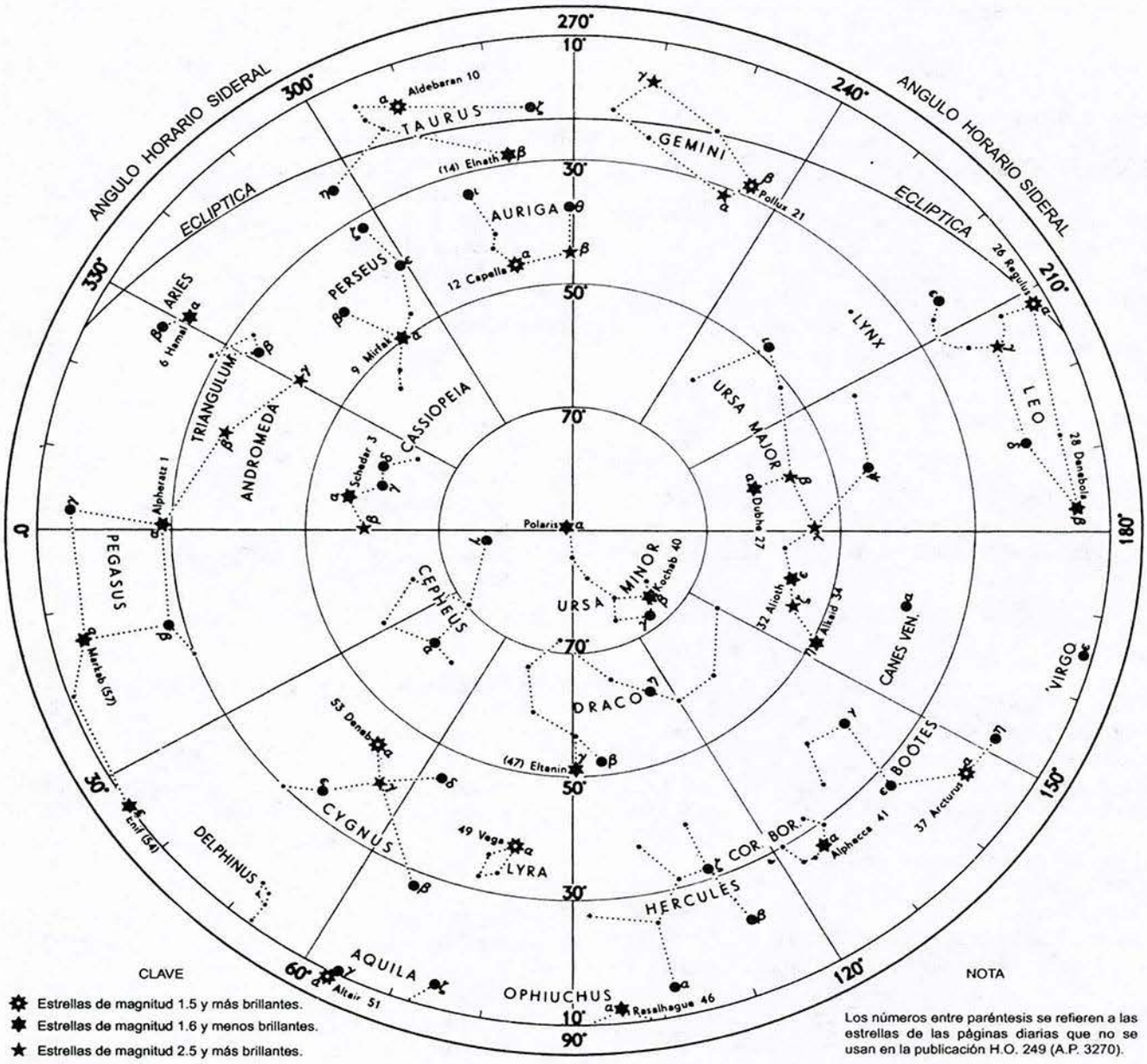
2 La hora de verano, es una hora adelantada del tiempo dado, se mantiene desde el primer domingo de abril, hasta el último domingo de octubre, cambiando a las $02^h\,00^m$ hora local.

3 Exentos del horario de verano.

4 Una pequeña porción del estado está en otra zona de tiempo.

CARTA CELESTE

HEMISFERIO BOREAL



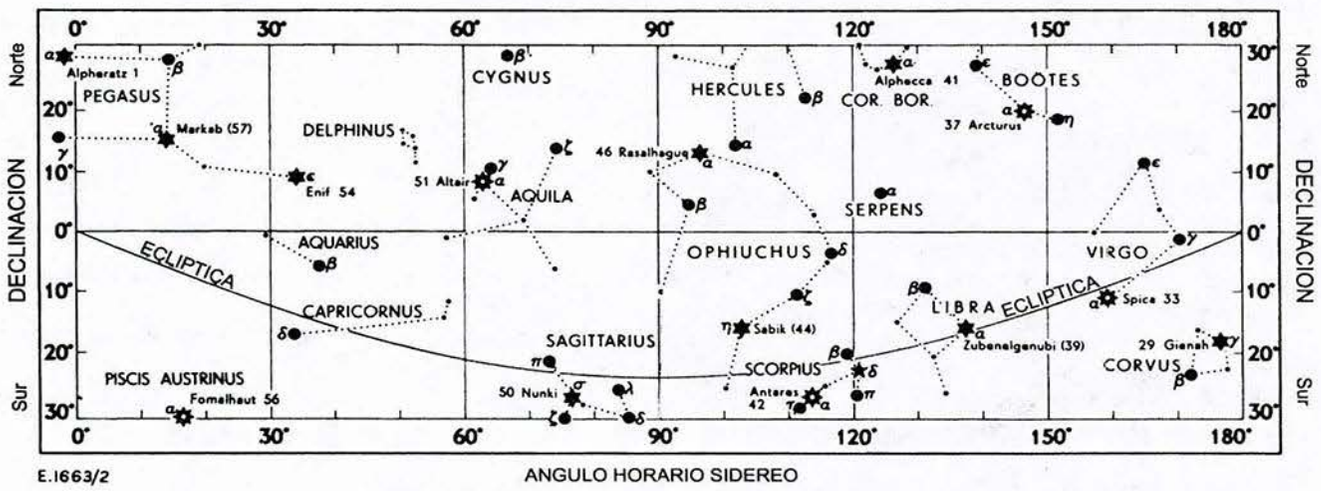
CLAVE

- Estrellas de magnitud 1.5 y más brillantes.
- Estrellas de magnitud 1.6 y menos brillantes.
- Estrellas de magnitud 2.5 y más brillantes.
- Estrellas de magnitud 2.6 y menos brillantes.
- Estrellas no tabuladas

NOTA

Los números entre paréntesis se refieren a las estrellas de las páginas diarias que no se usan en la publicación H.O. 249 (A.P. 3270).

ESTRELLAS ECUATORIALES (A.H.S. DE 0° a 180°)



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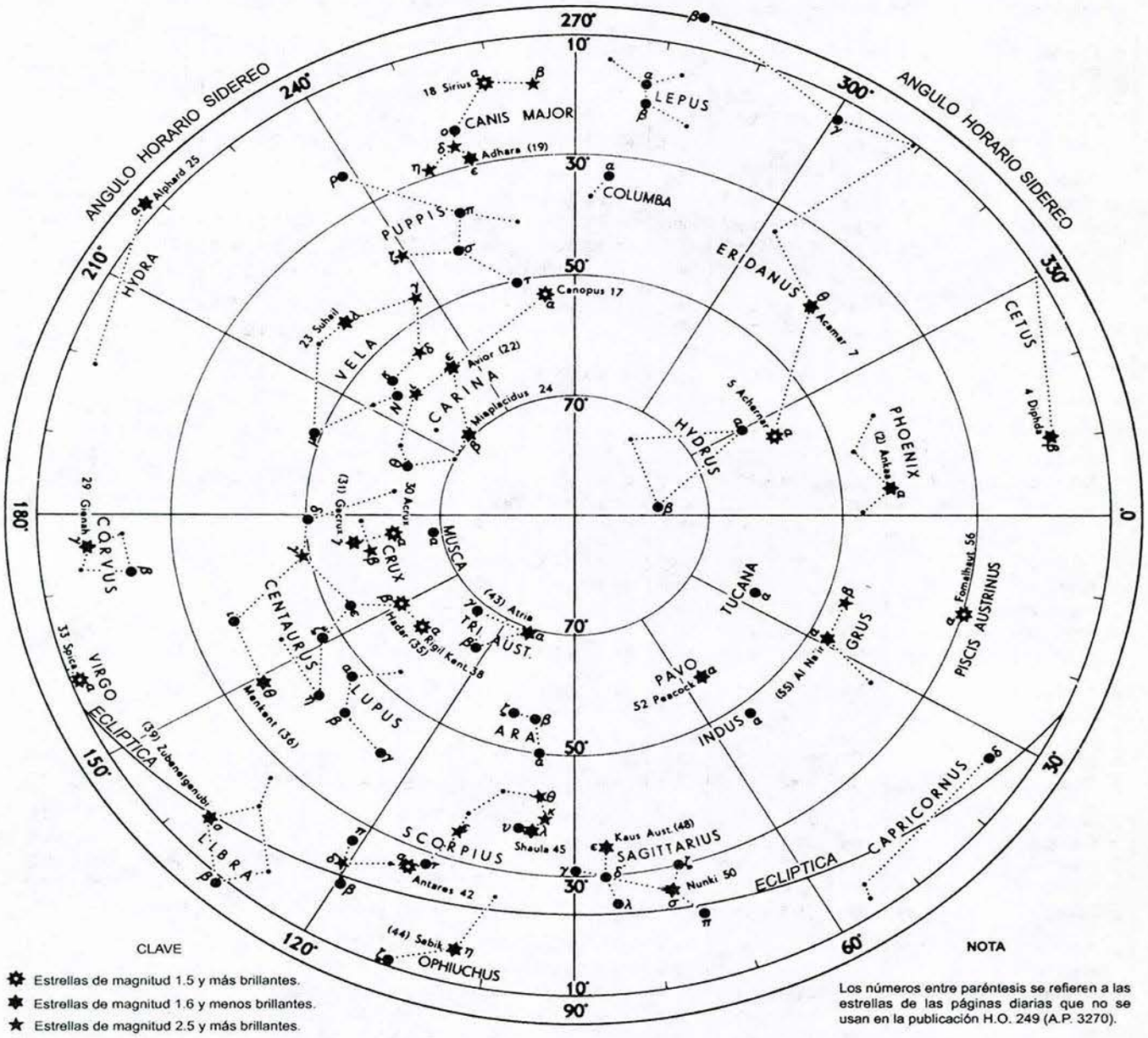
CARTA CELESTE

HEMISFERIO AUSTRAL



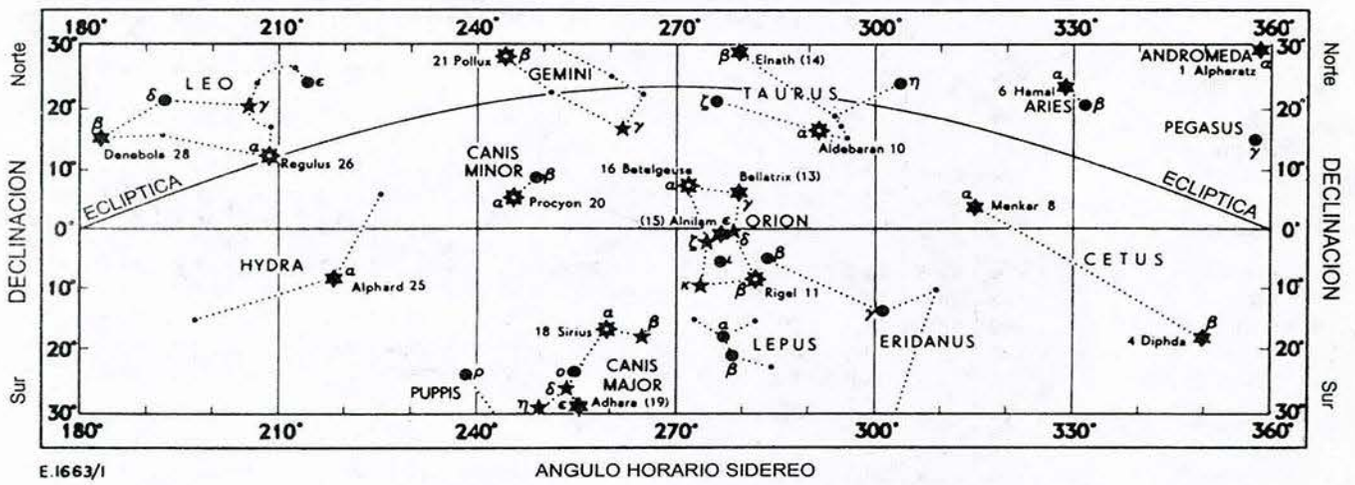
CLAVE

- Estrellas de magnitud 1.5 y más brillantes.
- Estrellas de magnitud 1.6 y menos brillantes.
- Estrellas de magnitud 2.5 y más brillantes.
- Estrellas de magnitud 2.6 y menos brillantes.
- Estrellas no tabuladas.

NOTA

Los números entre paréntesis se refieren a las estrellas de las páginas diarias que no se usan en la publicación H.O. 249 (A.P. 3270).

ESTRELLAS ECUATORIALES (A.H.S. DE 180° a 360°)



E.1663/1

ANGULO HORARIO SIDEREO

Mag.	Nombre y Número		A.H.S.	ENE.	FEB.	MAR.	ABR.	MAY.	JUN.	Declinación	ENE.	FEB.	MAR.	ABR.	MAY.	JUN.
			°	′	′	′	′	′	′	°	′	′	′	′	′	′
3·4	γ Cephei		5	09·9	10·4	10·6	10·4	09·8	09·0	N 77	38·5	38·4	38·2	38·1	38·0	38·0
2·6	α Pegasi	57	13	48·2	48·3	48·3	48·1	47·9	47·7	N 15	12·6	12·5	12·5	12·4	12·5	12·6
2·6	β Pegasi		14	03·1	03·1	03·1	03·0	02·8	02·5	N 28	05·3	05·2	05·1	05·1	05·1	05·2
1·3	α Piscis Aust.	56	15	34·9	34·9	34·9	34·7	34·5	34·3	S 29	37·3	37·2	37·1	37·0	36·9	36·8
2·2	β Gruis		19	19·7	19·7	19·7	19·5	19·2	18·9	S 46	53·1	53·0	52·8	52·7	52·6	52·5
2·9	α Tucanæ		25	22·3	22·3	22·2	22·0	21·6	21·2	S 60	15·6	15·4	15·3	15·1	15·0	15·0
2·2	α Gruis	55	27	56·2	56·2	56·1	55·9	55·6	55·3	S 46	57·6	57·5	57·4	57·3	57·2	57·1
3·0	δ Capricorni		33	14·1	14·1	14·0	13·8	13·6	13·3	S 16	07·5	07·5	07·5	07·4	07·3	07·3
2·5	ε Pegasi	54	33	57·0	56·9	56·9	56·7	56·5	56·2	N 9	52·7	52·6	52·6	52·6	52·7	52·8
3·1	β Aquarii		37	06·3	06·3	06·2	06·0	05·8	05·6	S 5	34·1	34·1	34·1	34·1	34·0	33·9
2·6	α Cephei		40	21·6	21·7	21·5	21·2	20·8	20·5	N 62	35·5	35·3	35·2	35·1	35·1	35·2
2·6	ε Cygni		48	26·8	26·7	26·6	26·4	26·1	25·9	N 33	58·4	58·3	58·2	58·2	58·2	58·3
1·3	α Cygni	53	49	38·6	38·5	38·4	38·1	37·9	37·6	N 45	17·0	16·9	16·8	16·7	16·8	16·9
3·2	α Indi		50	36·2	36·1	35·9	35·6	35·3	35·0	S 47	17·4	17·3	17·2	17·1	17·1	17·1
2·1	α Pavonis	52	53	35·1	34·9	34·7	34·3	33·9	33·6	S 56	44·0	43·9	43·8	43·7	43·7	43·7
2·3	γ Cygni		54	26·6	26·5	26·4	26·1	25·9	25·6	N 40	15·6	15·4	15·3	15·3	15·4	15·5
0·9	α Aquilæ	51	62	18·1	18·0	17·8	17·6	17·3	17·1	N 8	52·2	52·1	52·1	52·1	52·2	52·3
2·8	γ Aquilæ		63	25·9	25·8	25·7	25·4	25·2	25·0	N 10	36·9	36·8	36·8	36·8	36·8	36·9
3·0	δ Cygni		63	45·5	45·4	45·2	44·9	44·7	44·4	N 45	08·0	07·8	07·7	07·7	07·8	07·9
3·2	β Cygni		67	19·1	19·0	18·8	18·6	18·4	18·2	N 27	57·7	57·5	57·5	57·5	57·5	57·7
3·0	π Sagittarii		72	33·3	33·1	32·9	32·7	32·4	32·2	S 21	01·3	01·3	01·3	01·3	01·3	01·3
3·0	ζ Aquilæ		73	38·7	38·6	38·4	38·1	37·9	37·8	N 13	51·8	51·8	51·7	51·7	51·8	51·9
2·7	ζ Sagittarii		74	20·5	20·4	20·1	19·9	19·6	19·4	S 29	52·7	52·7	52·7	52·7	52·6	52·6
2·1	σ Sagittarii	50	76	10·7	10·6	10·3	10·1	09·8	09·6	S 26	17·7	17·7	17·7	17·7	17·7	17·7
0·1	α Lyræ	49	80	46·0	45·8	45·6	45·3	45·1	44·9	N 38	47·0	46·9	46·8	46·8	46·9	47·0
2·9	λ Sagittarii		82	60·1	59·9	59·7	59·5	59·2	59·1	S 25	25·2	25·2	25·2	25·2	25·2	25·2
2·0	ε Sagittarii	48	83	57·1	56·9	56·6	56·4	56·1	55·9	S 34	23·0	23·0	23·0	23·0	23·0	23·0
2·8	δ Sagittarii		84	44·8	44·6	44·3	44·1	43·8	43·6	S 29	49·6	49·6	49·6	49·6	49·6	49·6
3·1	γ Sagittarii		88	32·5	32·3	32·1	31·8	31·6	31·4	S 30	25·4	25·4	25·4	25·4	25·4	25·4
2·4	γ Draconis	47	90	51·2	50·9	50·7	50·4	50·1	50·0	N 51	29·2	29·1	29·0	29·1	29·2	29·3
2·9	β Ophiuchi		94	07·7	07·5	07·3	07·1	06·9	06·8	N 4	34·0	33·9	33·9	33·9	33·9	34·0
2·5	κ Scorpii		94	22·3	22·1	21·8	21·5	21·3	21·1	S 39	01·7	01·7	01·7	01·7	01·8	01·8
2·0	θ Scorpii		95	39·8	39·6	39·3	39·0	38·7	38·6	S 42	59·8	59·8	59·8	59·8	59·8	59·9
2·1	α Ophiuchi	46	96	15·8	15·6	15·4	15·2	15·0	14·9	N 12	33·5	33·4	33·4	33·4	33·5	33·6
1·7	λ Scorpii	45	96	35·5	35·2	35·0	34·7	34·5	34·3	S 37	06·2	06·2	06·2	06·2	06·2	06·3
3·0	α Aræ		97	02·0	01·7	01·4	01·0	00·7	00·6	S 49	52·5	52·4	52·4	52·5	52·5	52·6
2·8	υ Scorpii		97	18·2	17·9	17·6	17·4	17·1	17·0	S 37	17·7	17·7	17·7	17·7	17·7	17·8
3·0	β Draconis		97	23·8	23·5	23·2	22·9	22·7	22·6	N 52	17·9	17·8	17·7	17·8	17·9	18·1
2·8	β Aræ		98	40·1	39·8	39·4	39·0	38·7	38·5	S 55	31·7	31·6	31·6	31·7	31·7	31·8
Var.‡	α Herculis		101	20·1	19·9	19·7	19·4	19·3	19·2	N 14	23·3	23·2	23·2	23·2	23·3	23·4
2·6	η Ophiuchi	44	102	24·0	23·8	23·5	23·3	23·1	23·0	S 15	43·5	43·5	43·6	43·6	43·6	43·6
3·1	ζ Aræ		105	20·3	19·9	19·5	19·2	18·9	18·7	S 55	59·3	59·3	59·3	59·3	59·4	59·5
2·4	ε Scorpii		107	27·1	26·9	26·6	26·4	26·2	26·1	S 34	17·6	17·6	17·6	17·6	17·7	17·7
1·9	α Triang. Aust.	43	107	49·6	49·0	48·5	47·9	47·5	47·3	S 69	01·5	01·5	01·5	01·6	01·7	01·8
3·0	ζ Herculis		109	40·6	40·4	40·1	39·9	39·8	39·7	N 31	36·0	35·9	35·8	35·9	36·0	36·1
2·7	ζ Ophiuchi		110	42·3	42·0	41·8	41·6	41·5	41·4	S 10	34·1	34·1	34·2	34·2	34·2	34·2
2·9	τ Scorpii		111	01·3	01·1	00·9	00·6	00·4	00·4	S 28	12·9	13·0	13·0	13·1	13·1	13·1
2·8	β Herculis		112	26·5	26·3	26·1	25·8	25·7	25·6	N 21	29·2	29·1	29·0	29·1	29·2	29·3
1·2	α Scorpii	42	112	38·5	38·2	38·0	37·8	37·6	37·5	S 26	25·9	26·0	26·0	26·0	26·1	26·1
2·9	η Draconis		113	60·5	60·2	59·8	59·4	59·3	59·3	N 61	30·5	30·4	30·4	30·5	30·7	30·8
3·0	δ Ophiuchi		116	24·5	24·2	24·0	23·8	23·7	23·6	S 3	41·8	41·8	41·9	41·9	41·9	41·8
2·8	β Scorpii		118	38·0	37·8	37·6	37·3	37·2	37·1	S 19	48·4	48·4	48·5	48·5	48·5	48·5
2·5	δ Scorpii		119	54·6	54·3	54·1	53·9	53·7	53·7	S 22	37·3	37·4	37·4	37·5	37·5	37·5
3·0	π Scorpii		120	16·8	16·5	16·3	16·1	15·9	15·9	S 26	06·9	06·9	07·0	07·0	07·1	07·1
3·0	β Trianguli Aust.		121	12·3	11·8	11·4	11·0	10·8	10·7	S 63	25·7	25·7	25·8	25·9	26·0	26·2
2·8	α Serpentis		123	55·6	55·4	55·2	55·0	54·9	54·9	N 6	25·3	25·3	25·2	25·2	25·3	25·4
3·0	γ Lupi		126	12·4	12·1	11·8	11·6	11·4	11·4	S 41	10·0	10·0	10·1	10·2	10·3	10·3
2·3	α Coronæ Bor.	41	126	19·4	19·2	19·0	18·8	18·7	18·7	N 26	42·6	42·5	42·5	42·5	42·6	42·7

‡ 3·0 — 3·7

Mag.	Nombre y Número		A.H.S.	JUL.	AGO.	SEP.	OCT.	NOV.	DIC.	Declinación	JUL.	AGO.	SEP.	OCT.	NOV.	DIC.
			°	′	′	′	′	′	′	°	′	′	′	′	′	′
3·4	γ Cephei		5	08·3	07·7	07·5	07·7	08·1	08·8	N 77	38·1	38·2	38·4	38·6	38·8	38·8
2·6	*Markab*	57	13	47·5	47·3	47·2	47·3	47·3	47·4	N 15	12·7	12·8	12·9	12·9	13·0	12·9
2·6	*Scheat*		14	02·3	02·1	02·0	02·1	02·2	02·3	N 28	05·3	05·4	05·6	05·6	05·7	05·7
1·3	*Fomalhaut*	56	15	34·0	33·8	33·7	33·8	33·9	34·0	S 29	36·8	36·8	36·8	36·9	36·9	37·0
2·2	β Gruis		19	18·6	18·4	18·3	18·4	18·5	18·7	S 46	52·5	52·5	52·6	52·7	52·8	52·8
2·9	α Tucanæ		25	20·8	20·5	20·5	20·6	20·8	21·1	S 60	15·0	15·1	15·2	15·3	15·4	15·4
2·2	*Al Na'ir*	55	27	55·0	54·8	54·8	54·9	55·0	55·2	S 46	57·1	57·2	57·3	57·3	57·4	57·4
3·0	δ Capricorni		33	13·1	13·0	13·0	13·0	13·1	13·2	S 16	07·2	07·2	07·2	07·2	07·2	07·3
2·5	*Enif*	54	33	56·0	55·9	55·9	56·0	56·1	56·2	N 9	52·9	53·0	53·0	53·1	53·1	53·0
3·1	β Aquarii		37	05·4	05·3	05·3	05·3	05·5	05·5	S 5	33·9	33·8	33·8	33·8	33·8	33·9
2·6	*Alderamin*		40	20·2	20·1	20·3	20·5	20·9	21·2	N 62	35·3	35·5	35·7	35·8	35·8	35·8
2·6	ε Cygni		48	25·7	25·7	25·7	25·9	26·0	26·1	N 33	58·5	58·6	58·8	58·8	58·8	58·7
1·3	*Deneb*	53	49	37·4	37·4	37·5	37·7	37·9	38·0	N 45	17·1	17·2	17·4	17·4	17·4	17·4
3·2	α Indi		50	34·8	34·7	34·7	34·9	35·1	35·2	S 47	17·1	17·2	17·3	17·3	17·4	17·3
2·1	*Peacock*	52	53	33·3	33·2	33·3	33·5	33·7	33·9	S 56	43·8	43·9	44·0	44·0	44·0	44·0
2·3	γ Cygni		54	25·5	25·5	25·6	25·7	25·9	26·0	N 40	15·6	15·8	15·9	16·0	16·0	15·9
0·9	*Altair*	51	62	17·0	17·0	17·1	17·2	17·3	17·4	N 8	52·4	52·4	52·5	52·5	52·5	52·4
2·8	γ Aquilæ		63	24·9	24·9	24·9	25·1	25·2	25·3	N 10	37·0	37·1	37·2	37·2	37·2	37·1
3·0	δ Cygni		63	44·3	44·3	44·5	44·7	44·9	45·0	N 45	08·1	08·2	08·3	08·4	08·3	08·2
3·2	*Albireo*		67	18·1	18·1	18·2	18·3	18·5	18·5	N 27	57·8	57·9	58·0	58·0	58·0	57·9
3·0	π Sagittarii		72	32·1	32·1	32·2	32·3	32·4	32·5	S 21	01·2	01·2	01·3	01·3	01·3	01·3
3·0	ζ Aquilæ		73	37·7	37·7	37·8	37·9	38·0	38·1	N 13	52·0	52·1	52·1	52·1	52·1	52·0
2·7	ζ Sagittarii		74	19·3	19·3	19·4	19·5	19·6	19·7	S 29	52·7	52·7	52·7	52·7	52·7	52·7
2·1	*Nunki*	50	76	09·5	09·5	09·6	09·8	09·9	09·9	S 26	17·7	17·7	17·7	17·7	17·7	17·7
0·1	*Vega*	49	80	44·9	44·9	45·1	45·3	45·5	45·5	N 38	47·2	47·3	47·4	47·4	47·3	47·2
2·9	λ Sagittarii		82	59·0	59·0	59·1	59·2	59·3	59·3	S 25	25·2	25·2	25·3	25·3	25·3	25·3
2·0	*Kaus Australis*	48	83	55·8	55·9	56·0	56·1	56·2	56·2	S 34	23·0	23·1	23·1	23·1	23·1	23·1
2·8	δ Sagittarii		84	43·6	43·6	43·7	43·8	43·9	43·9	S 29	49·6	49·7	49·7	49·7	49·7	49·7
3·1	γ Sagittarii		88	31·4	31·4	31·5	31·6	31·7	31·7	S 30	25·4	25·5	25·5	25·5	25·5	25·4
2·4	*Eltanin*	47	90	50·0	50·1	50·4	50·6	50·8	50·9	N 51	29·5	29·6	29·7	29·6	29·5	29·4
2·9	β Ophiuchi		94	06·7	06·8	06·9	07·0	07·1	07·1	N 4	34·1	34·1	34·2	34·1	34·1	34·0
2·5	κ Scorpii		94	21·0	21·1	21·2	21·4	21·5	21·5	S 39	01·9	01·9	01·9	01·9	01·9	01·8
2·0	θ Scorpii		95	38·5	38·6	38·7	38·9	39·0	39·0	S 42	60·0	60·0	60·0	60·0	60·0	59·9
2·1	*Rasalhague*	46	96	14·8	14·9	15·0	15·2	15·2	15·2	N 12	33·7	33·7	33·7	33·7	33·7	33·6
1·7	*Shaula*	45	96	34·3	34·3	34·5	34·6	34·7	34·7	S 37	06·3	06·3	06·4	06·4	06·3	06·3
3·0	α Aræ		97	00·5	00·6	00·8	01·0	01·1	01·0	S 49	52·7	52·8	52·8	52·8	52·7	52·6
2·8	υ Scorpii		97	16·9	17·0	17·1	17·3	17·4	17·3	S 37	17·8	17·9	17·9	17·9	17·8	17·8
3·0	β Draconis		97	22·6	22·8	23·0	23·3	23·5	23·5	N 52	18·2	18·3	18·4	18·3	18·2	18·0
2·8	β Aræ		98	38·5	38·6	38·8	39·0	39·2	39·1	S 55	31·9	32·0	32·0	32·0	31·9	31·9
Var.‡	α Herculis		101	19·2	19·2	19·4	19·5	19·6	19·5	N 14	23·5	23·5	23·5	23·5	23·4	23·3
2·6	*Sabik*	44	102	23·0	23·1	23·2	23·3	23·4	23·3	S 15	43·6	43·5	43·5	43·5	43·6	43·6
3·1	ζ Aræ		105	18·7	18·8	19·1	19·3	19·4	19·3	S 55	59·6	59·7	59·7	59·7	59·6	59·5
2·4	ε Scorpii		107	26·1	26·1	26·3	26·4	26·5	26·4	S 34	17·8	17·8	17·8	17·8	17·7	17·7
1·9	*Atria*	43	107	47·4	47·6	48·0	48·4	48·5	48·4	S 69	01·9	02·0	02·0	02·0	01·9	01·8
3·0	ζ Herculis		109	39·7	39·8	40·0	40·2	40·2	40·2	N 31	36·2	36·3	36·3	36·2	36·1	36·0
2·7	ζ Ophiuchi		110	41·4	41·4	41·6	41·7	41·7	41·6	S 10	34·1	34·1	34·1	34·1	34·1	34·2
2·9	τ Scorpii		111	00·3	00·4	00·6	00·7	00·7	00·6	S 28	13·1	13·2	13·2	13·1	13·1	13·1
2·8	β Herculis		112	25·7	25·8	25·9	26·0	26·1	26·0	N 21	29·4	29·4	29·4	29·4	29·3	29·2
1·2	*Antares*	42	112	37·5	37·6	37·7	37·8	37·9	37·8	S 26	26·1	26·1	26·1	26·1	26·1	26·1
2·9	η Draconis		113	59·4	59·7	60·0	60·3	60·5	60·5	N 61	30·9	31·0	31·0	30·9	30·7	30·6
3·0	δ Ophiuchi		116	23·6	23·7	23·8	23·9	24·0	23·9	S 3	41·8	41·8	41·8	41·8	41·8	41·9
2·8	β Scorpii		118	37·2	37·2	37·4	37·5	37·5	37·4	S 19	48·5	48·5	48·5	48·5	48·5	48·5
2·5	*Dschubba*		119	53·7	53·8	53·9	54·0	54·0	53·9	S 22	37·5	37·5	37·5	37·5	37·5	37·5
3·0	π Scorpii		120	15·9	16·0	16·1	16·2	16·2	16·1	S 26	07·1	07·1	07·1	07·1	07·0	07·0
3·0	β Trianguli Aust.		121	10·8	11·0	11·3	11·6	11·6	11·4	S 63	26·3	26·3	26·3	26·2	26·1	26·0
2·8	α Serpentis		123	54·9	55·0	55·1	55·2	55·2	55·1	N 6	25·4	25·4	25·4	25·4	25·3	25·2
3·0	γ Lupi		126	11·4	11·6	11·7	11·8	11·8	11·7	S 41	10·4	10·4	10·4	10·3	10·2	10·2
2·3	*Alphecca*	41	126	18·7	18·8	19·0	19·1	19·1	19·0	N 26	42·8	42·9	42·8	42·8	42·6	42·5

‡ 3·0 — 3·7

Mag.	Nombre y Número		A.H.S.							Declinación						
				ENE.	FEB.	MAR.	ABR.	MAY.	JUN.		ENE.	FEB.	MAR.	ABR	MAY.	JUN.
			°	′	′	′	′	′	′	°	′	′	′	′	′	′
3·1	γ Ursæ Minoris		129	49·7	49·1	48·6	48·2	48·1	48·2	N 71	49·6	49·5	49·6	49·7	49·9	50·0
3·1	γ Trianguli Aust.		130	15·7	15·1	14·6	14·2	14·0	14·0	S 68	40·6	40·7	40·7	40·9	41·0	41·2
2·7	β Libræ		130	44·5	44·2	44·0	43·8	43·7	43·7	S 9	23·1	23·2	23·2	23·3	23·3	23·2
2·8	β Lupi		135	21·4	21·1	20·9	20·7	20·6	20·6	S 43	08·0	08·1	08·2	08·3	08·4	08·4
2·9	α Libræ	39	137	16·3	16·1	15·9	15·7	15·6	15·6	S 16	02·6	02·7	02·8	02·8	02·8	02·8
2·2	β Ursæ Minoris	40	137	20·0	19·3	18·7	18·4	18·3	18·6	N 74	08·9	08·8	08·9	09·0	09·1	09·3
2·6	ε Bootis		138	44·9	44·6	44·4	44·2	44·2	44·2	N 27	04·1	04·0	04·0	04·1	04·2	04·3
2·9	α Lupi		139	30·4	30·1	29·9	29·7	29·6	29·6	S 47	23·2	23·3	23·4	23·5	23·7	23·7
0·1	α Centauri	38	140	05·4	05·0	04·6	04·4	04·3	04·4	S 60	50·0	50·0	50·2	50·3	50·4	50·6
2·6	η Centauri		141	06·8	06·5	06·2	06·1	06·0	06·0	S 42	09·5	09·5	09·6	09·7	09·8	09·9
3·0	γ Bootis		141	58·5	58·3	58·0	57·9	57·8	57·9	N 38	18·1	18·0	18·0	18·1	18·2	18·4
0·2	α Bootis	37	146	04·7	04·4	04·2	04·1	04·1	04·1	N 19	10·6	10·5	10·5	10·5	10·6	10·7
2·3	θ Centauri	36	148	19·2	18·9	18·7	18·5	18·5	18·5	S 36	22·2	22·3	22·4	22·5	22·6	22·7
0·9	β Centauri	35	149	01·9	01·5	01·2	01·0	00·9	01·0	S 60	22·3	22·4	22·5	22·7	22·8	22·9
3·1	ζ Centauri		151	06·2	05·9	05·7	05·5	05·5	05·6	S 47	17·3	17·4	17·5	17·6	17·8	17·8
2·8	η Bootis		151	19·3	19·0	18·8	18·7	18·7	18·7	N 18	23·5	23·4	23·4	23·5	23·5	23·6
1·9	η Ursæ Majoris	34	153	06·5	06·2	06·0	05·9	05·9	06·0	N 49	18·3	18·3	18·3	18·4	18·6	18·7
2·6	ε Centauri		155	01·0	00·6	00·4	00·2	00·2	00·3	S 53	27·9	28·1	28·2	28·3	28·5	28·5
1·2	α Virginis	33	158	41·5	41·3	41·1	41·0	41·0	41·1	S 11	09·9	10·0	10·0	10·1	10·1	10·1
2·2	ζ Ursæ Majoris		159	00·7	00·4	00·1	00·0	00·1	00·2	N 54	55·0	55·0	55·1	55·2	55·3	55·4
2·9	ι Centauri		159	50·4	50·1	49·9	49·8	49·8	49·9	S 36	42·8	42·9	43·0	43·1	43·2	43·3
3·0	ε Virginis		164	26·8	26·6	26·4	26·3	26·3	26·4	N 10	57·2	57·1	57·1	57·1	57·2	57·2
2·9	α Canum Venat.		165	59·0	58·8	58·6	58·6	58·6	58·7	N 38	18·6	18·6	18·7	18·8	18·9	18·9
1·7	ε Ursæ Majoris	32	166	29·0	28·7	28·5	28·4	28·5	28·7	N 55	57·1	57·1	57·1	57·3	57·4	57·5
1·5	β Crucis		168	03·3	03·0	02·8	02·7	02·8	03·0	S 59	41·3	41·4	41·6	41·8	41·9	42·0
2·9	γ Virginis		169	34·5	34·3	34·1	34·1	34·1	34·2	S 1	27·2	27·3	27·4	27·4	27·4	27·3
2·4	γ Centauri		169	36·5	36·2	36·0	36·0	36·0	36·2	S 48	57·6	57·7	57·9	58·0	58·1	58·2
2·9	α Muscæ		170	41·3	40·8	40·6	40·5	40·6	40·9	S 69	08·1	08·2	08·4	08·6	08·7	08·8
2·8	β Corvi		171	23·5	23·3	23·2	23·1	23·1	23·2	S 23	24·0	24·1	24·2	24·3	24·3	24·3
1·6	γ Crucis	31	172	11·7	11·4	11·2	11·1	11·2	11·4	S 57	06·8	06·9	07·1	07·3	07·4	07·4
1·1	α Crucis	30	173	20·1	19·7	19·5	19·5	19·6	19·8	S 63	05·9	06·1	06·2	06·4	06·5	06·6
2·8	γ Corvi	29	176	02·2	02·0	01·9	01·9	01·9	02·0	S 17	32·7	32·8	32·9	33·0	33·0	33·0
2·9	δ Centauri		177	53·8	53·6	53·4	53·4	53·5	53·7	S 50	43·4	43·5	43·7	43·8	43·9	44·0
2·5	γ Ursæ Majoris		181	31·8	31·5	31·4	31·4	31·5	31·7	N 53	41·2	41·2	41·3	41·4	41·5	41·6
2·2	β Leonis	28	182	43·4	43·2	43·1	43·1	43·2	43·3	N 14	33·9	33·9	33·9	33·9	34·0	34·0
2·6	δ Leonis		191	27·6	27·4	27·4	27·4	27·4	27·5	N 20	31·0	31·0	31·0	31·1	31·1	31·2
3·2	ψ Ursæ Majoris		192	34·2	34·0	33·9	33·9	34·1	34·2	N 44	29·4	29·5	29·5	29·7	29·7	29·8
2·0	α Ursæ Majoris	27	194	03·1	02·8	02·7	02·8	03·0	03·2	N 61	44·5	44·6	44·7	44·9	45·0	45·0
2·4	β Ursæ Majoris		194	31·4	31·2	31·1	31·1	31·3	31·5	N 56	22·4	22·5	22·6	22·7	22·8	22·8
2·8	μ Velorum		198	17·6	17·4	17·4	17·5	17·6	17·8	S 49	25·3	25·5	25·6	25·8	25·8	25·8
3·0	θ Carinæ		199	14·7	14·4	14·4	14·6	14·9	15·2	S 64	23·7	23·9	24·1	24·2	24·3	24·3
2·3	γ Leonis		204	59·6	59·4	59·4	59·4	59·5	59·6	N 19	50·1	50·1	50·1	50·2	50·2	50·2
1·3	α Leonis	26	207	53·6	53·5	53·4	53·5	53·6	53·7	N 11	57·7	57·7	57·7	57·7	57·7	57·7
3·1	ε Leonis		213	31·3	31·2	31·2	31·3	31·4	31·5	N 23	46·1	46·1	46·1	46·2	46·2	46·2
3·0	*N* Velorum		217	10·7	10·7	10·7	11·0	11·2	11·5	S 57	02·2	02·4	02·5	02·6	02·7	02·6
2·2	α Hydræ	25	218	05·3	05·3	05·3	05·4	05·5	05·6	S 8	39·8	39·9	39·9	39·9	39·9	39·9
2·6	κ Velorum		219	27·4	27·3	27·4	27·6	27·8	28·1	S 55	00·8	00·9	01·1	01·2	01·2	01·2
2·2	ι Carinæ		220	42·7	42·6	42·8	43·0	43·3	43·5	S 59	16·6	16·8	17·0	17·1	17·1	17·1
1·8	β Carinæ	24	221	40·9	40·9	41·1	41·5	41·9	42·4	S 69	43·1	43·3	43·5	43·6	43·6	43·6
2·2	λ Velorum	23	222	59·2	59·1	59·2	59·4	59·6	59·7	S 43	26·1	26·3	26·4	26·5	26·5	26·4
3·1	ι Ursæ Majoris		225	10·7	10·6	10·7	10·8	11·0	11·1	N 48	02·2	02·2	02·3	02·4	02·4	02·4
2·0	δ Velorum		228	48·5	48·5	48·6	48·9	49·1	49·4	S 54	42·6	42·8	43·0	43·0	43·0	43·0
1·7	ε Carinæ	22	234	21·4	21·4	21·6	21·9	22·2	22·4	S 59	30·7	30·9	31·0	31·1	31·1	31·0
1·9	γ Velorum		237	36·1	36·2	36·3	36·5	36·7	36·9	S 47	20·4	20·5	20·6	20·7	20·7	20·6
2·9	ρ Puppis		238	06·0	06·0	06·1	06·2	06·3	06·4	S 24	18·5	18·6	18·7	18·7	18·7	18·6
2·3	ζ Puppis		239	05·4	05·4	05·5	05·7	05·9	06·0	S 40	00·4	00·5	00·6	00·7	00·6	00·5
1·2	β Geminorum	21	243	39·2	39·2	39·3	39·4	39·5	39·6	N 28	01·4	01·4	01·4	01·5	01·5	01·5
0·5	α Canis Minoris	20	245	09·6	09·6	09·6	09·8	09·9	09·9	N 5	13·3	13·2	13·2	13·2	13·3	13·3

Mag.	Nombre y Número		A.H.S.	JUL.	AGO.	SEP.	OCT.	NOV.	DIC.	Declinación	JUL.	AGO.	SEP.	OCT.	NOV.	DIC.
			°	′	′	′	′	′	′	°	′	′	′	′	′	′
3·1	γ Ursæ Minoris		129	48·6	49·1	49·6	50·0	50·2	50·0	N 71	50·1	50·1	50·0	49·9	49·7	49·5
3·1	γ Trianguli Aust.		130	14·2	14·5	14·9	15·1	15·2	14·9	S 68	41·3	41·3	41·3	41·2	41·0	40·9
2·7	β Libræ		130	43·8	43·9	44·0	44·0	44·0	43·9	S 9	23·2	23·2	23·2	23·2	23·2	23·3
2·8	β Lupi		135	20·6	20·8	20·9	21·0	21·0	20·8	S 43	08·5	08·5	08·4	08·4	08·3	08·3
2·9	*Zubenelgenubi*	39	137	15·7	15·8	15·9	16·0	15·9	15·8	S 16	02·8	02·8	02·8	02·8	02·8	02·8
2·2	*Kochab*	40	137	19·1	19·6	20·2	20·5	20·7	20·4	N 74	09·4	09·4	09·3	09·1	08·9	08·7
2·6	ε Bootis		138	44·3	44·4	44·5	44·6	44·6	44·4	N 27	04·4	04·4	04·3	04·2	04·1	04·0
2·9	α Lupi		139	29·7	29·8	30·0	30·1	30·0	29·8	S 47	23·8	23·8	23·7	23·6	23·6	23·5
0·1	*Rigil Kent.*	38	140	04·5	04·8	05·0	05·2	05·1	04·8	S 60	50·6	50·6	50·6	50·4	50·3	50·3
2·6	η Centauri		141	06·1	06·2	06·4	06·5	06·4	06·2	S 42	09·9	09·9	09·9	09·8	09·7	09·7
3·0	γ Bootis		141	58·0	58·1	58·3	58·4	58·3	58·2	N 38	18·4	18·4	18·4	18·3	18·1	17·9
0·2	*Arcturus*	37	146	04·2	04·3	04·4	04·4	04·4	04·2	N 19	10·7	10·7	10·7	10·6	10·5	10·4
2·3	*Menkent*	36	148	18·6	18·7	18·9	18·9	18·8	18·6	S 36	22·7	22·7	22·6	22·5	22·5	22·5
0·9	*Hadar*	35	149	01·2	01·5	01·7	01·8	01·7	01·4	S 60	23·0	23·0	22·9	22·8	22·6	22·6
3·1	ζ Centauri		151	05·7	05·8	06·0	06·0	05·9	05·7	S 47	17·9	17·8	17·8	17·7	17·6	17·6
2·8	η Bootis		151	18·8	18·9	19·0	19·0	19·0	18·8	N 18	23·7	23·7	23·6	23·6	23·4	23·3
1·9	*Alkaid*	34	153	06·1	06·3	06·5	06·5	06·5	06·2	N 49	18·7	18·7	18·6	18·5	18·3	18·1
2·6	ε Centauri		155	00·5	00·7	00·8	00·9	00·7	00·4	S 53	28·6	28·5	28·5	28·3	28·3	28·2
1·2	*Spica*	33	158	41·1	41·2	41·3	41·3	41·2	41·0	S 11	10·1	10·0	10·0	10·0	10·0	10·1
2·2	*Mizar*		159	00·4	00·6	00·8	00·8	00·7	00·4	N 54	55·5	55·4	55·3	55·1	54·9	54·8
2·9	ι Centauri		159	50·0	50·1	50·2	50·2	50·1	49·9	S 36	43·3	43·2	43·2	43·1	43·0	43·0
3·0	ε Virginis		164	26·5	26·6	26·6	26·6	26·5	26·3	N 10	57·3	57·3	57·3	57·2	57·1	57·0
2·9	*Cor Caroli*		165	58·8	58·9	59·0	59·0	58·9	58·6	N 38	19·0	18·9	18·8	18·7	18·5	18·4
1·7	*Alioth*	32	166	28·9	29·1	29·2	29·2	29·0	28·7	N 55	57·5	57·4	57·3	57·1	57·0	56·8
1·5	*Mimosa*		168	03·2	03·4	03·6	03·6	03·3	03·0	S 59	42·0	41·9	41·8	41·7	41·6	41·6
2·9	γ Virginis		169	34·2	34·3	34·4	34·3	34·2	34·0	S 1	27·3	27·3	27·3	27·3	27·4	27·5
2·4	*Muhlifain*		169	36·3	36·5	36·6	36·5	36·4	36·1	S 48	58·2	58·1	58·0	57·9	57·8	57·8
2·9	α Muscæ		170	41·3	41·7	41·9	41·9	41·6	41·1	S 69	08·8	08·7	08·6	08·5	08·4	08·3
2·8	β Corvi		171	23·3	23·4	23·4	23·4	23·3	23·0	S 23	24·3	24·2	24·2	24·1	24·1	24·2
1·6	*Gacrux*	31	172	11·6	11·8	11·9	11·9	11·7	11·3	S 57	07·4	07·4	07·3	07·1	07·0	07·0
1·1	*Acrux*	30	173	20·1	20·4	20·5	20·5	20·2	19·8	S 63	06·6	06·5	06·4	06·3	06·2	06·2
2·8	*Gienah*	29	176	02·1	02·1	02·2	02·1	02·0	01·7	S 17	33·0	32·9	32·9	32·8	32·9	32·9
2·9	δ Centauri		177	53·8	54·0	54·0	54·0	53·8	53·4	S 50	44·0	43·9	43·8	43·6	43·6	43·6
2·5	*Phecda*		181	31·8	32·0	32·0	31·9	31·7	31·3	N 53	41·6	41·5	41·3	41·2	41·0	40·9
2·2	*Denebola*	28	182	43·3	43·4	43·4	43·3	43·1	42·9	N 14	34·0	34·0	34·0	33·9	33·8	33·7
2·6	δ Leonis		191	27·6	27·6	27·6	27·5	27·3	27·1	N 20	31·2	31·1	31·1	31·0	30·9	30·8
3·2	ψ Ursæ Majoris		192	34·3	34·4	34·3	34·2	34·0	33·7	N 44	29·7	29·7	29·5	29·4	29·3	29·2
2·0	*Dubhe*	27	194	03·4	03·5	03·5	03·3	03·0	02·5	N 61	44·9	44·8	44·6	44·5	44·3	44·2
2·4	*Merak*		194	31·7	31·7	31·7	31·5	31·2	30·8	N 56	22·8	22·7	22·5	22·4	22·2	22·1
2·8	μ Velorum		198	18·0	18·1	18·0	17·9	17·6	17·3	S 49	25·8	25·6	25·5	25·4	25·4	25·4
3·0	θ Carinæ		199	15·5	15·6	15·6	15·4	15·1	14·6	S 64	24·3	24·1	24·0	23·9	23·8	23·9
2·3	*Algeiba*		204	59·7	59·7	59·6	59·5	59·2	59·0	N 19	50·2	50·2	50·2	50·1	50·0	49·9
1·3	*Regulus*	26	207	53·7	53·7	53·6	53·5	53·3	53·0	N 11	57·8	57·8	57·7	57·7	57·6	57·5
3·1	ε Leonis		213	31·5	31·5	31·4	31·2	31·0	30·7	N 23	46·2	46·2	46·1	46·1	46·0	45·9
3·0	*N* Velorum		217	11·6	11·7	11·5	11·3	11·0	10·6	S 57	02·5	02·4	02·2	02·1	02·1	02·2
2·2	*Alphard*	25	218	05·6	05·6	05·5	05·3	05·1	04·8	S 8	39·8	39·8	39·7	39·7	39·8	39·9
2·6	κ Velorum		219	28·2	28·2	28·1	27·9	27·5	27·2	S 55	01·1	00·9	00·8	00·7	00·7	00·8
2·2	ι Carinæ		220	43·7	43·7	43·6	43·4	43·0	42·6	S 59	16·9	16·8	16·6	16·6	16·6	16·7
1·8	*Miaplacidus*	24	221	42·6	42·7	42·5	42·2	41·7	41·2	S 69	43·5	43·3	43·2	43·1	43·1	43·2
2·2	*Suhail*	23	222	59·8	59·8	59·7	59·4	59·2	58·9	S 43	26·3	26·2	26·1	26·0	26·0	26·1
3·1	ι Ursæ Majoris		225	11·1	11·0	10·9	10·6	10·3	09·9	N 48	02·3	02·2	02·1	02·0	02·0	01·9
2·0	δ Velorum		228	49·5	49·4	49·3	49·0	48·7	48·4	S 54	42·8	42·7	42·6	42·5	42·5	42·6
1·7	*Avior*	22	234	22·5	22·5	22·3	22·0	21·6	21·3	S 59	30·9	30·7	30·6	30·5	30·6	30·7
1·9	γ Velorum		237	36·9	36·9	36·7	36·4	36·1	35·9	S 47	20·4	20·3	20·2	20·1	20·2	20·3
2·9	ρ Puppis		238	06·4	06·3	06·2	06·0	05·7	05·5	S 24	18·5	18·4	18·3	18·3	18·3	18·4
2·3	ζ Puppis		239	06·0	05·9	05·8	05·5	05·3	05·0	S 40	00·4	00·3	00·2	00·1	00·2	00·3
1·2	*Pollux*	21	243	39·5	39·4	39·2	39·0	38·7	38·5	N 28	01·4	01·4	01·4	01·3	01·3	01·3
0·5	*Procyon*	20	245	09·9	09·7	09·6	09·4	09·1	08·9	N 5	13·3	13·4	13·4	13·4	13·3	13·2

Mag.	Nombre y Número		A.H.S.	ENE.	FEB.	MAR.	ABR.	MAY.	JUN.	Declinación	ENE.	FEB.	MAR.	ABR.	MAY.	JUN.
			°	′	′	′	′	′	′	°	′	′	′	′	′	′
1·6	α Geminorum		246	19·9	19·9	20·0	20·1	20·2	20·3	N 31	53·1	53·2	53·2	53·2	53·2	53·2
3·3	σ Puppis		247	40·7	40·8	40·9	41·1	41·3	41·4	S 43	18·3	18·4	18·5	18·5	18·5	18·4
3·1	β Canis Minoris		248	11·8	11·8	11·9	12·0	12·1	12·1	N 8	17·2	17·1	17·1	17·1	17·2	17·2
2·4	η Canis Majoris		248	57·7	57·8	57·9	58·0	58·2	58·3	S 29	18·4	18·5	18·6	18·6	18·5	18·4
2·7	π Puppis		250	42·0	42·1	42·2	42·4	42·6	42·7	S 37	06·0	06·2	06·2	06·3	06·2	06·1
2·0	δ Canis Majoris		252	53·3	53·3	53·5	53·6	53·7	53·8	S 26	23·8	23·9	23·9	24·0	23·9	23·8
3·1	ο Canis Majoris		254	13·8	13·8	14·0	14·1	14·2	14·3	S 23	50·2	50·3	50·3	50·3	50·3	50·2
1·6	ε Canis Majoris	19	255	19·8	19·8	20·0	20·1	20·3	20·3	S 28	58·5	58·6	58·7	58·7	58·6	58·5
2·8	τ Puppis		257	30·1	30·3	30·5	30·7	30·9	31·0	S 50	37·1	37·2	37·3	37·3	37·2	37·1
−1·6	α Canis Majoris	18	258	42·0	42·0	42·1	42·3	42·4	42·4	S 16	43·1	43·2	43·3	43·3	43·2	43·1
1·9	γ Geminorum		260	33·3	33·4	33·5	33·6	33·7	33·7	N 16	23·8	23·8	23·8	23·9	23·9	23·9
−0·9	α Carinæ	17	263	59·9	60·1	60·3	60·6	60·8	60·9	S 52	41·9	42·1	42·1	42·1	42·0	41·9
2·0	β Canis Majoris		264	18·7	18·7	18·9	19·0	19·1	19·1	S 17	57·5	57·6	57·6	57·6	57·6	57·5
2·7	θ Aurigæ		270	03·0	03·1	03·2	03·4	03·5	03·5	N 37	12·7	12·8	12·8	12·8	12·8	12·7
2·1	β Aurigæ		270	05·8	05·9	06·1	06·2	06·3	06·3	N 44	56·9	56·9	57·0	56·9	56·9	56·8
Var.‡	α Orionis	16	271	11·5	11·6	11·7	11·8	11·9	11·9	N 7	24·3	24·3	24·3	24·3	24·3	24·4
2·2	κ Orionis		273	02·8	02·9	03·0	03·1	03·2	03·2	S 9	40·3	40·4	40·4	40·4	40·3	40·2
1·9	ζ Orionis		274	47·8	47·8	48·0	48·1	48·1	48·1	S 1	56·6	56·7	56·7	56·7	56·6	56·6
2·8	α Columbæ		275	04·5	04·6	04·8	05·0	05·1	05·1	S 34	04·6	04·7	04·7	04·7	04·6	04·5
3·0	ζ Tauri		275	34·4	34·4	34·5	34·7	34·7	34·7	N 21	08·5	08·5	08·5	08·5	08·5	08·5
1·8	ε Orionis	15	275	55·9	56·0	56·1	56·3	56·3	56·3	S 1	12·2	12·2	12·3	12·2	12·2	12·1
2·9	ι Orionis		276	07·7	07·7	07·9	08·0	08·1	08·0	S 5	54·7	54·7	54·8	54·7	54·7	54·6
2·7	α Leporis		276	48·3	48·3	48·5	48·6	48·7	48·7	S 17	49·5	49·5	49·5	49·5	49·4	49·3
2·5	δ Orionis		276	59·0	59·1	59·2	59·4	59·4	59·4	S 0	18·0	18·1	18·1	18·1	18·0	17·9
3·0	β Leporis		277	55·5	55·6	55·8	55·9	56·0	56·0	S 20	45·7	45·8	45·8	45·8	45·7	45·6
1·8	β Tauri	14	278	24·6	24·7	24·8	24·9	25·0	25·0	N 28	36·5	36·5	36·5	36·5	36·5	36·5
1·7	γ Orionis	13	278	42·2	42·2	42·3	42·5	42·5	42·5	N 6	20·9	20·9	20·9	20·9	20·9	21·0
0·2	α Aurigæ	12	280	48·4	48·5	48·7	48·9	49·0	48·9	N 45	60·0	60·0	60·0	60·0	59·9	59·9
0·3	β Orionis	11	281	21·1	21·2	21·3	21·5	21·5	21·5	S 8	12·2	12·2	12·2	12·2	12·2	12·1
2·9	β Eridani		283	01·4	01·5	01·7	01·8	01·8	01·8	S 5	05·3	05·3	05·3	05·3	05·2	05·1
2·9	ι Aurigæ		285	44·1	44·2	44·3	44·4	44·5	44·4	N 33	10·1	10·1	10·1	10·1	10·0	10·0
1·1	α Tauri	10	291	00·3	00·4	00·5	00·6	00·7	00·6	N 16	30·6	30·6	30·6	30·6	30·6	30·6
3·2	γ Eridani		300	28·8	29·0	29·1	29·2	29·2	29·1	S 13	30·5	30·6	30·6	30·5	30·4	30·3
3·0	ε Persei		300	31·2	31·3	31·5	31·6	31·6	31·5	N 40	00·8	00·8	00·8	00·8	00·7	00·7
2·9	ζ Persei		301	27·1	27·2	27·3	27·4	27·4	27·3	N 31	53·2	53·2	53·2	53·1	53·1	53·1
3·0	η Tauri		303	06·9	07·0	07·1	07·2	07·2	07·1	N 24	06·5	06·5	06·4	06·4	06·4	06·4
1·9	α Persei	9	308	54·1	54·3	54·5	54·6	54·6	54·4	N 49	52·0	52·0	52·0	51·9	51·8	51·7
Var.§	β Persei		312	56·5	56·7	56·8	56·9	56·9	56·7	N 40	57·6	57·6	57·6	57·5	57·5	57·4
2·8	α Ceti	8	314	25·1	25·2	25·3	25·4	25·3	25·2	N 4	05·5	05·5	05·5	05·5	05·5	05·6
3·1	θ Eridani	7	315	25·5	25·7	25·9	26·0	25·9	25·8	S 40	18·4	18·4	18·4	18·2	18·1	17·9
2·1	α Ursæ Minoris		321	41·7	53·8	64·0	69·5	67·6	59·9	N 89	16·3	16·3	16·3	16·1	16·0	15·9
3·1	β Trianguli		327	36·1	36·2	36·3	36·4	36·3	36·1	N 34	59·6	59·5	59·5	59·4	59·4	59·4
2·2	α Arietis	6	328	11·7	11·8	11·9	11·9	11·9	11·7	N 23	28·0	28·0	27·9	27·9	27·9	27·9
2·2	γ Andromedæ		329	00·7	00·9	01·0	01·1	01·0	00·7	N 42	20·2	20·1	20·1	20·0	19·9	19·9
3·0	α Hydri		330	18·1	18·4	18·6	18·7	18·6	18·4	S 61	34·3	34·3	34·2	34·0	33·8	33·6
2·7	β Arietis		331	19·7	19·9	19·9	20·0	19·9	19·7	N 20	48·7	48·7	48·7	48·6	48·6	48·7
0·6	α Eridani	5	335	33·9	34·2	34·3	34·4	34·3	34·0	S 57	14·3	14·3	14·2	14·0	13·8	13·6
2·8	δ Cassiopeiæ		338	32·0	32·2	32·4	32·4	32·3	31·9	N 60	14·6	14·5	14·4	14·3	14·2	14·2
2·4	β Andromedæ		342	33·4	33·5	33·6	33·6	33·5	33·2	N 35	37·6	37·5	37·5	37·4	37·4	37·4
Var.‖	γ Cassiopeiæ		345	48·7	49·0	49·1	49·1	48·9	48·5	N 60	43·5	43·4	43·3	43·2	43·1	43·1
2·2	β Ceti	4	349	05·7	05·8	05·8	05·8	05·6	05·4	S 17	59·1	59·1	59·1	59·0	58·9	58·8
2·5	α Cassiopeiæ	3	349	51·8	52·0	52·2	52·1	51·9	51·6	N 56	32·7	32·6	32·5	32·4	32·3	32·3
2·4	α Phœnicis	2	353	25·4	25·5	25·5	25·5	25·3	25·0	S 42	18·4	18·3	18·2	18·1	17·9	17·8
2·9	β Hydri		353	33·8	34·3	34·5	34·4	34·0	33·2	S 77	15·3	15·2	15·1	14·9	14·7	14·6
2·9	γ Pegasi		356	41·0	41·1	41·1	41·0	40·9	40·7	N 15	11·3	11·2	11·2	11·2	11·2	11·3
2·4	β Cassiopeiæ		357	41·9	42·1	42·2	42·1	41·8	41·5	N 59	09·5	09·4	09·2	09·1	09·1	09·1
2·2	α Andromedæ	1	357	53·7	53·8	53·9	53·8	53·6	53·4	N 29	05·8	05·7	05·6	05·6	05·6	05·6

‡ 0·1 — 1·2 § 2·3 — 3·5 ‖ Variable irregular ; 1999 mag. 2·2

Mag.	Nombre y Número		A.H.S.							Declinación						
				JUL.	AGO.	SEP.	OCT.	NOV.	DIC.		JUL.	AGO.	SEP.	OCT.	NOV.	DIC.
			°	′	′	′	′	′	′	°	′	′	′	′	′	′
1·6	*Castor*		**246**	20·2	20·1	19·9	19·6	19·4	19·1	**N 31**	53·2	53·1	53·1	53·1	53·0	53·0
3·3	σ Puppis		**247**	41·4	41·3	41·1	40·8	40·6	40·4	**S 43**	18·2	18·1	18·0	17·9	18·0	18·2
3·1	β Canis Minoris		**248**	12·1	12·0	11·8	11·6	11·3	11·1	**N 8**	17·2	17·3	17·3	17·3	17·2	17·1
2·4	η Canis Majoris		**248**	58·2	58·1	57·9	57·7	57·5	57·3	**S 29**	18·3	18·2	18·1	18 1	18·2	18·3
2·7	π Puppis		**250**	42·6	42·5	42·3	42·1	41·8	41·6	**S 37**	06·0	05·8	05·7	05·7	05·8	05·9
2·0	*Wezen*		**252**	53·8	53·6	53·4	53·2	53·0	52·8	**S 26**	23·7	23·6	23·5	23·5	23·5	23·7
3·1	*o* Canis Majoris		**254**	14·2	14·1	13·9	13·7	13·5	13·3	**S 23**	50·1	50·0	49·9	49·9	50·0	50·1
1·6	*Adhara*	19	**255**	20·3	20·1	19·9	19·7	19·5	19·3	**S 28**	58·4	58·3	58·2	58·2	58·3	58·4
2·8	τ Puppis		**257**	31·0	30·9	30·6	30·3	30·0	29·8	**S 50**	36·9	36·8	36·7	36·7	36·7	36·9
−1·6	*Sirius*	18	**258**	42·3	42·2	42·0	41·8	41·6	41·4	**S 16**	43·0	42·9	42·9	42·9	42·9	43·1
1·9	*Alhena*		**260**	33·6	33·4	33·2	33·0	32·8	32·6	**N 16**	23·9	23·9	23·9	23·9	23·9	23·9
−0·9	*Canopus*	17	**263**	60·8	60·7	60·4	60·1	59·8	59·6	**S 52**	41·7	41·6	41·5	41·5	41·6	41·7
2·0	*Mirzam*		**264**	19·0	18·9	18·7	18·5	18·2	18·1	**S 17**	57·3	57·2	57·2	57·2	57·3	57·4
2·7	θ Aurigæ		**270**	03·3	03·1	02·8	02·6	02·3	02·1	**N 37**	12·7	12·7	12·7	12·7	12·7	12·7
2·1	*Menkalinan*		**270**	06·2	05·9	05·6	05·3	05·0	04·8	**N 44**	56·8	56·7	56·7	56·7	56·8	56·8
Var.‡	*Betelgeuse*	16	**271**	11·8	11·6	11·3	11·1	10·9	10·8	**N 7**	24·4	24·5	24·5	24·5	24·5	24·4
2·2	κ Orionis		**273**	03·1	02·9	02·7	02·5	02·3	02·2	**S 9**	40·1	40·0	40·0	40·0	40·0	40·1
1·9	*Alnitak*		**274**	48·0	47·8	47·6	47·4	47·2	47·1	**S 1**	56·5	56·4	56·4	56·4	56·4	56·5
2·8	*Phact*		**275**	05·0	04·8	04·5	04·3	04·1	04·0	**S 34**	04·3	04·2	04·1	04·1	04·2	04·4
3·0	ζ Tauri		**275**	34·6	34·4	34·1	33·9	33·7	33·5	**N 21**	08·6	08·6	08·6	08·6	08·6	08·6
1·8	*Alnilam*	15	**275**	56·2	56·0	55·8	55·6	55·4	55·2	**S 1**	12·0	12·0	11·9	11·9	12·0	12·0
2·9	ι Orionis		**276**	07·9	07·7	07·5	07·3	07·1	07·0	**S 5**	54·5	54·4	54·4	54·4	54·4	54·5
2·7	α Leporis		**276**	48·6	48·4	48·1	47·9	47·7	47·6	**S 17**	49·2	49·1	49·1	49·1	49·2	49·3
2·5	δ Orionis		**276**	59·3	59·1	58·9	58·6	58·5	58·3	**S 0**	17·9	17·8	17·8	17·8	17·8	17·9
3·0	β Leporis		**277**	55·9	55·7	55·4	55·2	55·0	54·9	**S 20**	45·4	45·3	45·3	45·3	45·4	45·5
1·8	*Elnath*	14	**278**	24·8	24·6	24·3	24·1	23·9	23·7	**N 28**	36·4	36·5	36·5	36·5	36·5	36·5
1·7	*Bellatrix*	13	**278**	42·4	42·2	41·9	41·7	41·5	41·4	**N 6**	21·1	21·1	21·2	21·2	21·1	21·1
0·2	*Capella*	12	**280**	48·7	48·4	48·1	47·8	47·6	47·4	**N 45**	59·8	59·8	59·8	59·9	59·9	60·0
0·3	*Rigel*	11	**281**	21·3	21·2	20·9	20·7	20·5	20·4	**S 8**	12·0	11·9	11·8	11·8	11·9	12·0
2·9	β Eridani		**283**	01·6	01·4	01·2	01·0	00·8	00·7	**S 5**	05·0	05·0	04·9	04·9	05·0	05·1
2·9	ι Aurigæ		**285**	44·2	44·0	43·7	43·5	43·2	43·1	**N 33**	10·0	10·0	10·0	10·1	10·1	10·2
1·1	*Aldebaran*	10	**290**	60·4	60·2	59·9	59·7	59·6	59·5	**N 16**	30·7	30·7	30·8	30·8	30·8	30·8
3·2	γ Eridani		**300**	28·9	28·7	28·5	28·3	28·2	28·1	**S 13**	30·2	30·1	30·1	30·1	30·2	30·3
3·0	ε Persei		**300**	31·2	30·9	30·7	30·4	30·2	30·2	**N 40**	00·7	00·7	00·8	00·8	00·9	01·0
2·9	ζ Persei		**301**	27·1	26·8	26·6	26·4	26·2	26·1	**N 31**	53·1	53·2	53·2	53·3	53·3	53·4
3·0	*Alcyone*		**303**	06·9	06·6	06·4	06·2	06·0	06·0	**N 24**	06·4	06·5	06·6	06·6	06·7	06·7
1·9	*Mirfak*	9	**308**	54·1	53·8	53·4	53·2	53·0	53·0	**N 49**	51·7	51·8	51·8	51·9	52·1	52·2
Var.§	*Algol*		**312**	56·5	56·2	55·9	55·7	55·6	55·5	**N 40**	57·4	57·5	57·6	57·7	57·8	57·9
2·8	*Menkar*	8	**314**	25·0	24·8	24·5	24·4	24·3	24·3	**N 4**	05·7	05·8	05·8	05·8	05·8	05·8
3·1	*Acamar*	7	**315**	25·6	25·3	25·0	24·9	24·8	24·8	**S 40**	17·8	17·7	17·7	17·8	17·9	18·0
2·1	*Polaris*		**321**	48·0	34·6	23·1	15·4	12·9	17·4	**N 89**	15·8	15·9	16·0	16·2	16·3	16·5
3·1	β Trianguli		**327**	35·8	35·6	35·3	35·2	35·1	35·1	**N 34**	59·4	59·5	59·6	59·7	59·8	59·9
2·2	*Hamal*	6	**328**	11·4	11·2	11·0	10·8	10·8	10·8	**N 23**	28·0	28·1	28·2	28·2	28·3	28·3
2·2	*Almak*		**328**	60·5	60·2	59·9	59·8	59·7	59·7	**N 42**	19·9	20·0	20·1	20·3	20·4	20·4
3·0	α Hydri		**330**	18·0	17·6	17·3	17·1	17·1	17·3	**S 61**	33·5	33·5	33·6	33·7	33·8	34·0
2·7	*Sheratan*		**331**	19·4	19·2	19·0	18·9	18·8	18·9	**N 20**	48·8	48·8	48·9	49·0	49 0	49·1
0·6	*Achernar*	5	**335**	33·7	33·3	33·0	32·9	32·9	33·1	**S 57**	13·5	13·5	13·6	13·7	13·8	14·0
2·8	*Ruchbah*		**338**	31·5	31·1	30·9	30·7	30·7	30·8	**N 60**	14·2	14·3	14·5	14·6	14·8	14·9
2·4	*Mirach*		**342**	33·0	32·7	32·5	32·4	32·4	32·5	**N 35**	37·5	37·6	37·7	37·8	37·9	37·9
Var.‖	γ Cassiopeiæ		**345**	48·2	47·8	47·5	47·4	47·5	47·7	**N 60**	43·1	43·2	43·4	43·6	43·7	43·8
2·2	*Diphda*	4	**349**	05·2	05·0	04·8	04·8	04·8	04·8	**S 17**	58·7	58·6	58·6	58·6	58·7	58·8
2·5	*Schedar*	3	**349**	51·2	50·9	50·7	50·6	50·7	50·8	**N 56**	32·4	32·5	32·7	32·8	33·0	33·1
2·4	*Ankaa*	2	**353**	24·8	24·5	24·3	24·3	24·3	24·5	**S 42**	17·7	17·7	17·8	17·9	18·0	18·1
2·9	β Hydri		**353**	32·4	31·7	31·2	31·2	31·5	32·1	**S 77**	14·5	14·6	14·7	14·8	15·0	15·0
2·9	*Algenib*		**356**	40·4	40·2	40·1	40·1	40·1	40·2	**N 15**	11·4	11·5	11·6	11·6	11·7	11·7
2·4	*Caph*		**357**	41·1	40·8	40·6	40·6	40·7	40·9	**N 59**	09·1	09·3	09·5	09·6	09·8	09·8
2·2	*Alpheratz*	1	**357**	53·1	52·9	52·8	52·7	52·8	52·9	**N 29**	05·7	05·8	06·0	06·1	06·1	06·1

‡ 0·1 — 1·2 § 2·3 — 3·5 ‖ Variable irregular ; 1999 mag. 2·2

TABLAS PARA LA ESTRELLA POLAR, 2001

PARA DETERMINAR LA LATITUD CONFORME A ALTURA DEL SEXTANTE Y PARA AZIMUT

A.H.L. ARIES	0° – 9°	10° – 19°	20° – 29°	30° – 39°	40° – 49°	50° – 59°	60° – 69°	70° – 79°	80° – 89°	90° – 99°	100° – 109°	110° – 119°
	a_0	a_0	a_0	a_0	a_0	a_0	a_0	a_0	a_0	a_0	a_0	a_0
°	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	0 24·6	0 20·3	0 17·3	0 15·5	0 15·0	0 15·9	0 18·1	0 21·6	0 26·2	0 31·8	0 38·3	0 45·3
1	24·1	20·0	17·0	15·4	15·0	16·1	18·4	22·0	26·8	32·5	39·0	46·1
2	23·6	19·6	16·8	15·3	15·1	16·3	18·7	22·5	27·3	33·1	39·6	46·8
3	23·2	19·3	16·6	15·2	15·1	16·5	19·1	22·9	27·8	33·7	40·3	47·5
4	22·7	18·9	16·4	15·1	15·2	16·7	19·4	23·3	28·4	34·3	41·0	48·3
5	0 22·3	0 18·6	0 16·2	0 15·1	0 15·3	0 16·9	0 19·7	0 23·8	0 28·9	0 35·0	0 41·7	0 49·0
6	21·9	18·3	16·0	15·0	15·4	17·1	20·1	24·3	29·5	35·6	42·5	49·8
7	21·5	18·0	15·9	15·0	15·5	17·3	20·5	24·7	30·1	36·3	43·2	50·5
8	21·1	17·8	15·7	15·0	15·6	17·6	20·8	25·2	30·7	36·9	43·9	51·3
9	20·7	17·5	15·6	15·0	15·8	17·9	21·2	25·7	31·2	37·6	44·6	52·0
10	0 20·3	0 17·3	0 15·5	0 15·0	0 15·9	0 18·1	0 21·6	0 26·2	0 31·8	0 38·3	0 45·3	0 52·8
Lat.	a_1	a_1	a_1	a_1	a_1	a_1	a_1	a_1	a_1	a_1	a_1	a_1
°	′	′	′	′	′	′	′	′	′	′	′	′
0	0·5	0·5	0·6	0·6	0·6	0·6	0·5	0·5	0·4	0·4	0·3	0·3
10	·5	·6	·6	·6	·6	·6	·5	·5	·5	·4	·4	·3
20	·5	·6	·6	·6	·6	·6	·6	·5	·5	·4	·4	·4
30	·5	·6	·6	·6	·6	·6	·6	·5	·5	·5	·5	·4
40	0·6	0·6	0·6	0·6	0·6	0·6	0·6	0·6	0·5	0·5	0·5	0·5
45	·6	·6	·6	·6	·6	·6	·6	·6	·6	·6	·6	·5
50	·6	·6	·6	·6	·6	·6	·6	·6	·6	·6	·6	·6
55	·6	·6	·6	·6	·6	·6	·6	·6	·6	·6	·7	·7
60	·6	·6	·6	·6	·6	·6	·6	·7	·7	·7	·7	·7
62	0·7	0·6	0·6	0·6	0·6	0·6	0·6	0·7	0·7	0·7	0·8	0·8
64	·7	·6	·6	·6	·6	·6	·6	·7	·7	·8	·8	·8
66	·7	·6	·6	·6	·6	·6	·7	·7	·8	·8	·8	·9
68	0·7	0·7	0·6	0·6	0·6	0·6	0·7	0·7	0·8	0·9	0·9	0·9
Mes	a_2	a_2	a_2	a_2	a_2	a_2	a_2	a_2	a_2	a_2	a_2	a_2
	′	′	′	′	′	′	′	′	′	′	′	′
Ene.	0·7	0·7	0·7	0·7	0·7	0·7	0·7	0·7	0·7	0·7	0·7	0·6
Feb	·6	·7	·7	·7	·8	·8	·8	·8	·8	·8	·8	·8
Mar.	·5	·5	·6	·7	·7	·7	·8	·8	·9	·9	·9	·9
Abr.	0·3	0·4	0·5	0·5	0·6	0·6	0·7	0·8	0·8	0·9	0·9	0·9
May.	·2	·3	·3	·4	·4	·5	·6	·6	·7	·8	·8	·9
Jun.	·2	·2	·2	·3	·3	·4	·4	·5	·6	·6	·7	·8
Jul.	0·3	0·2	0·2	0·2	0·3	0·3	0·3	0·4	0·4	0·5	0·5	0·6
Ago.	·4	·3	·3	·3	·3	·3	·3	·3	·3	·4	·4	·4
Sep.	·6	·5	·5	·4	·4	·3	·3	·3	·3	·3	·3	·3
Oct.	0·7	0·7	0·6	0·6	0·5	0·5	0·4	0·4	0·3	0·3	0·3	0·3
Nov.	0·9	0·9	0·8	·8	·7	·6	·6	·5	·4	·4	·3	·3
Dic.	1·0	1·0	1·0	0·9	0·9	0·8	0·7	0·7	0·6	0·5	0·4	0·4
Lat.	AZIMUT											
°	°	°	°	°	°	°	°	°	°	°	°	°
0	0·4	0·3	0·2	0·0	359·9	359·8	359·7	359·6	359·5	359·4	359·3	359·3
20	0·4	0·3	0·2	0·0	359·9	359·8	359·6	359·5	359·4	359·3	359·3	359·2
40	0·5	0·4	0·2	0·1	359·9	359·7	359·6	359·4	359·3	359·2	359·1	359·1
50	0·6	0·5	0·3	0·1	359·9	359·7	359·5	359·3	359·2	359·0	359·0	358·9
55	0·7	0·5	0·3	0·1	359·8	359·6	359·4	359·2	359·1	358·9	358·8	358·8
60	0·8	0·6	0·3	0·1	359·8	359·6	359·3	359·1	358·9	358·8	358·6	358·6
65	1·0	0·7	0·4	0·1	359·8	359·5	359·2	358·9	358·7	358·5	358·4	358·3

Latitud = Altura aparente (corregida por refracción) $-1° + a_0 + a_1 + a_2$

Se entra a la tabla con el valor del A.H.L. de Aries para determinar la columna que debe usarse; cada columna se refiere a un alcance de 10°, a_0 se toma mediante interpolación mental, de la tabla superior con las unidades del A.H.L. de Aries en grados, como argumento; a_1 y a_2 se toman sin interpolación de la segunda y tercera tablas usando la latitud y el mes como argumento respectivamente; a_0, a_1, a_2 son siempre positivos. La tabla final da el azimut de la *Polar*.

TABLAS PARA LA ESTRELLA POLAR, 2001

PARA DETERMINAR LA LATITUD CONFORME A ALTURA DEL SEXTANTE Y POR AZIMUT

A.H.L. ARIES	120° – 129°	130° – 139°	140° – 149°	150° – 159°	160° – 169°	170° – 179°	180° – 189°	190° – 199°	200° – 209°	210° – 219°	220° – 229°	230° – 239°
	a_0	a_0	a_0	a_0	a_0	a_0	a_0	a_0	a_0	a_0	a_0	a_0
°	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	0 52·8	1 00·4	1 08·0	1 15·3	1 22·0	1 28·1	1 33·3	1 37·4	1 40·4	1 42·1	1 42·6	1 41·7
1	53·5	01·2	08·7	16·0	22·7	28·7	33·8	37·8	40·6	42·2	42·6	41·5
2	54·3	01·9	09·5	16·7	23·3	29·2	34·2	38·1	40·9	42·3	42·5	41·4
3	55·1	02·7	10·2	17·4	23·9	29·8	34·7	38·5	41·1	42·4	42·5	41·2
4	55·8	03·5	10·9	18·1	24·6	30·3	35·1	38·8	41·3	42·5	42·4	41·0
5	0 56·6	1 04·2	1 11·7	1 18·7	1 25·2	1 30·8	1 35·5	1 39·1	1 41·4	1 42·5	1 42·3	1 40·8
6	57·4	05·0	12·4	19·4	25·8	31·3	35·9	39·4	41·6	42·6	42·2	40·6
7	58·1	05·7	13·1	20·1	26·4	31·8	36·3	39·6	41·8	42·6	42·1	40·3
8	58·9	06·5	13·8	20·7	27·0	32·3	36·7	39·9	41·9	42·6	42·0	40·1
9	0 59·7	07·2	14·6	21·4	27·5	32·8	37·1	40·2	42·0	42·6	41·9	39·8
10	1 00·4	1 08·0	1 15·3	1 22·0	1 28·1	1 33·3	1 37·4	1 40·4	1 42·1	1 42·6	1 41·7	1 39·5
Lat.	a_1	a_1	a_1	a_1	a_1	a_1	a_1	a_1	a_1	a_1	a_1	a_1
°	′	′	′	′	′	′	′	′	′	′	′	′
0	0·3	0·3	0·3	0·3	0·4	0·4	0·5	0·5	0·6	0·6	0·6	0·6
10	·3	·3	·3	·4	·4	·5	·5	·6	·6	·6	·6	·6
20	·4	·4	·4	·4	·5	·5	·5	·6	·6	·6	·6	·6
30	·4	·4	·4	·5	·5	·5	·5	·6	·6	·6	·6	·6
40	0·5	0·5	0·5	0·5	0·5	0·6	0·6	0·6	0·6	0·6	0·6	0·6
45	·5	·5	·6	·6	·6	·6	·6	·6	·6	·6	·6	·6
50	·6	·6	·6	·6	·6	·6	·6	·6	·6	·6	·6	·6
55	·7	·7	·7	·7	·6	·6	·6	·6	·6	·6	·6	·6
60	·8	·7	·7	·7	·7	·7	·6	·6	·6	·6	·6	·6
62	0·8	0·8	0·8	0·8	0·7	0·7	0·7	0·6	0·6	0·6	0·6	0·6
64	·8	·8	·8	·8	·8	·7	·7	·6	·6	·6	·6	·6
66	0·9	0·9	·9	·8	·8	·7	·7	·6	·6	·6	·6	·6
68	1·0	1·0	0·9	0·9	0·8	0·8	0·7	0·7	0·6	0·6	0·6	0·6
Mes	a_2	a_2	a_2	a_2	a_2	a_2	a_2	a_2	a_2	a_2	a_2	a_2
	′	′	′	′	′	′	′	′	′	′	′	′
Ene.	0·6	0·6	0·6	0·6	0·5	0·5	0·5	0·5	0·5	0·5	0·5	0·5
Feb.	·8	·7	·7	·7	·6	·6	·6	·5	·5	·5	·4	·4
Mar.	0·9	0·9	0·9	0·8	·8	·8	·7	·7	·6	·5	·5	·5
Abr.	1·0	1·0	1·0	1·0	0·9	0·9	0·9	0·8	0·7	0·7	0·6	0·6
May.	0·9	1·0	1·0	1·0	1·0	1·0	1·0	0·9	0·9	·8	·8	·7
Jun.	·8	0·9	0·9	1·0	1·0	1·0	1·0	1·0	1·0	0·9	·9	·8
Jul.	0·7	0·7	0·8	0·8	0·9	0·9	0·9	1·0	1·0	1·0	0·9	0·9
Ago.	·5	·6	·6	·7	·7	·8	·8	0·9	0·9	0·9	·9	·9
Sep.	·4	·4	·4	·5	·5	·6	·6	·7	·7	·8	·8	·9
Oct.	0·3	0·3	0·3	0·3	0·4	0·4	0·5	0·5	0·6	0·6	0·7	0·7
Nov.	·3	·2	·2	·2	·2	·3	·3	·3	·4	·4	·5	·6
Dic.	0·3	0·3	0·2	0·2	0·2	0·2	0·2	0·2	0·2	0·3	0·3	0·4
Lat.	AZIMUT											
°	°	°	°	°	°	°	°	°	°	°	°	°
0	359·3	359·3	359·3	359·3	359·4	359·5	359·6	359·7	359·8	0·0	0·1	0·2
20	359·2	359·2	359·3	359·3	359·4	359·5	359·6	359·7	359·8	0·0	0·1	0·2
40	359·0	359·1	359·1	359·2	359·2	359·4	359·5	359·6	359·8	359·9	0·1	0·3
50	358·9	358·9	358·9	359·0	359·1	359·2	359·4	359·6	359·7	359·9	0·1	0·3
55	358·7	358·7	358·8	358·9	359·0	359·1	359·3	359·5	359·7	359·9	0·1	0·4
60	358·5	358·6	358·6	358·7	358·8	359·0	359·2	359·4	359·7	359·9	0·2	0·4
65	358·3	358·3	358·4	358·5	358·6	358·8	359·1	359·3	359·6	359·9	0·2	0·5

Ejemplo: 21 de abril del 2001, 23^h 18^{m}56^s T.U. en longitud Oeste 37° 14' la altura aparente (corregida por refracción), H_0, de la *Polar* fué 49° 31'.6

	°	′
De las páginas diarias		
A.H.G. de Aries (23^h)	195	04.6
Incremento a (18^{m}56^s)	4	44.8
Longitud (Oeste)	−37	14
A.H.L. de Aries	162	35

	°	′
H_0	49	31.6
a_0 (argumento 162° 35')	1	23.7
a_1 (Lat. 50° aprox.)		0.6
a_2 (abril)		0.9
Suma −1° = Lat. =	49	56.8

TABLAS PARA LA ESTRELLA POLAR, 2001

PARA DETERMINAR LA LATITUD CONFORME A ALTURA DEL SEXTANTE Y POR AZIMUT

A.H.L. ARIES	240° – 249°	250° – 259°	260° – 269°	270° – 279°	280° – 289°	290° – 299°	300° – 309°	310° – 319°	320° – 329°	330° – 339°	340° – 349°	350° – 359°
	a_0	a_0	a_0	a_0	a_0	a_0	a_0	a_0	a_0	a_0	a_0	a_0
°	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	1 39·5	1 36·2	1 31·7	1 26·2	1 19·8	1 12·9	1 05·5	0 57·8	0 50·2	0 42·9	0 36·0	0 29·9
1	39·3	35·8	31·2	25·6	19·2	12·1	04·7	57·1	49·5	42·2	35·4	29·3
2	39·0	35·3	30·6	25·0	18·5	11·4	03·9	56·3	48·8	41·5	34·7	28·7
3	38·7	34·9	30·1	24·3	17·8	10·7	03·2	55·6	48·0	40·8	34·1	28·2
4	38·3	34·5	29·6	23·7	17·1	09·9	02·4	54·8	47·3	40·1	33·5	27·6
5	1 38·0	1 34·0	1 29·0	1 23·1	1 16·4	1 09·2	1 01·7	0 54·0	0 46·5	0 39·4	0 32·8	0 27·1
6	37·7	33·6	28·5	22·5	15·7	08·5	00·9	53·3	45·8	38·7	32·2	26·6
7	37·3	33·1	27·9	21·8	15·0	07·7	1 00·1	52·5	45·1	38·0	31·6	26·0
8	36·9	32·6	27·3	21·2	14·3	07·0	0 59·4	51·8	44·3	37·4	31·0	25·5
9	36·6	32·2	26·8	20·5	13·6	06·2	58·6	51·0	43·6	36·7	30·4	25·0
10	1 36·2	1 31·7	1 26·2	1 19·8	1 12·9	1 05·5	0 57·8	0 50·2	0 42·9	0 36·0	0 29·9	0 24·6

Lat.	a_1	a_1	a_1	a_1	a_1	a_1	a_1	a_1	a_1	a_1	a_1	a_1
°	′	′	′	′	′	′	′	′	′	′	′	′
0	0·5	0·5	0·4	0·4	0·3	0·3	0·3	0·3	0·3	0·3	0·4	0·4
10	·5	·5	·5	·4	·4	·3	·3	·3	·3	·4	·4	·5
20	·6	·5	·5	·4	·4	·4	·4	·4	·4	·4	·5	·5
30	·6	·5	·5	·5	·5	·4	·4	·4	·4	·5	·5	·5
40	0·6	0·6	0·5	0·5	0·5	0·5	0·5	0·5	0·5	0·5	0·5	0·6
45	·6	·6	·6	·6	·6	·5	·5	·5	·6	·6	·6	·6
50	·6	·6	·6	·6	·6	·6	·6	·6	·6	·6	·6	·6
55	·6	·6	·6	·6	·7	·7	·7	·7	·7	·7	·6	·6
60	·6	·7	·7	·7	·7	·7	·8	·7	·7	·7	·7	·7
62	0·6	0·7	0·7	0·7	0·8	0·8	0·8	0·8	0·8	0·8	0·7	0·7
64	·6	·7	·7	·8	·8	·8	·8	·8	·8	·8	·8	·7
66	·7	·7	·8	·8	·8	·9	0·9	0·9	·9	·8	·8	·7
68	0·7	0·7	0·8	0·9	0·9	0·9	1·0	1·0	0·9	0·9	0·8	0·8

Mes	a_2	a_2	a_2	a_2	a_2	a_2	a_2	a_2	a_2	a_2	a_2	a_2
	′	′	′	′	′	′	′	′	′	′	′	′
Ene.	0·5	0·5	0·5	0·5	0·5	0·6	0·6	0·6	0·6	0·6	0·7	0·7
Feb	·4	·4	·4	·4	·4	·4	·4	·5	·5	·5	·6	·6
Mar.	·4	·4	·3	·3	·3	·3	·3	·3	·3	·4	·4	·4
Abr.	0·5	0·4	0·4	0·3	0·3	0·3	0·2	0·2	0·2	0·2	0·3	0·3
May.	·6	·6	·5	·4	·4	·3	·3	·2	·2	·2	·2	·2
Jun.	·8	·7	·6	·6	·5	·4	·4	·3	·3	·2	·2	·2
Jul.	0·9	0·8	0·8	0·7	0·7	0·6	0·5	0·5	0·4	0·4	0·3	0·3
Ago.	·9	·9	·9	·8	·8	·8	·7	·6	·6	·5	·5	·4
Sep.	·9	·9	·9	·9	·9	·9	·8	·8	·8	·7	·7	·6
Oct.	0·8	0·8	0·9	0·9	0·9	0·9	0·9	0·9	0·9	0·9	0·8	0·8
Nov.	·6	·7	·8	·8	·9	·9	·9	1·0	1·0	1·0	1·0	0·9
Dic.	0·5	0·5	0·6	0·7	0·8	0·8	0·9	0·9	1·0	1·0	1·0	1·0

Lat.	AZIMUT											
°	°	°	°	°	°	°	°	°	°	°	°	°
0	0·3	0·4	0·5	0·6	0·7	0·7	0·7	0·7	0·7	0·7	0·6	0·5
20	0·3	0·5	0·6	0·6	0·7	0·8	0·8	0·8	0·7	0·7	0·6	0·5
40	0·4	0·6	0·7	0·8	0·9	0·9	1·0	0·9	0·9	0·9	0·8	0·7
50	0·5	0·7	0·8	0·9	1·0	1·1	1·1	1·1	1·1	1·0	0·9	0·8
55	0·6	0·7	0·9	1·1	1·2	1·2	1·3	1·3	1·2	1·1	1·0	0·9
60	0·6	0·9	1·0	1·2	1·3	1·4	1·5	1·5	1·4	1·3	1·2	1·0
65	0·8	1·0	1·2	1·4	1·6	1·7	1·7	1·7	1·7	1·6	1·4	1·2

Latitud = Altura aparente (corregida por refracción) $1° + a_0 + a_1 + a_2$

Se entra a la tabla con el valor del A.H.L. de Aries para determinar la columna que debe usarse; cada columna se refiere a un alcance de 10°, a_0 se toma mediante interpolación mental, de la tabla superior con las unidades del A.H.L. de Aries en grados, como argumento; a_1 y a_2 se toman sin interpolación de la segunda y tercera tablas usando la latitud y el mes como argumento respectivamente; a_0 , a_1 , a_2 son siempre positivos. La tabla final da el azimut de la *Polar*.

PROCEDIMIENTO DE REDUCCIÓN DE VISUALES

MÉTODOS Y FÓRMULAS PARA CALCULO DIRECTO

1. *Introducción.* En esta sección se proporcionan fórmulas y métodos para *determinar* la posición en la mar a partir de alturas observadas con un sextante marino, usando una computadora personal o una calculadora programable.

El método usa conceptos y terminología similar a los usados en el *manual* de navegación astronómica donde la posición es determinada trazando líneas de posición con su intersección y azimut en una carta marina.

Los algoritmos se han expresado en notación algebraica traducibles al código o lenguaje utilizado por la calculadora. Los datos básicos de las efemérides, pueden ser tomados de las páginas tabulares principales del presente *Almanaque Náutico*. Las fórmulas permiten calcular altura y azimut de un astro a partir de su *AHG* y *Dec*, y de la posición estimada del observador. También se dan fórmulas para reducir las alturas observadas con sextante, aplicando las correcciones por: depresión, refracción, paralaje y semi-diámetro.

La intersección y azimut obtenidos de cada observación determinan una línea de posición y el observador deberá acercar o alejar cada una de ellas. El método de mínimos cuadrados es usado para calcular la fija mediante la determinación de la posición donde la suma de los cuadrados de las distancias de las líneas de posición es un mínimo. El uso de los mínimos cuadrados tiene otras ventajas. Por ejemplo, es posible mejorar la posición estimada en la hora de la fija al repetir el cálculo. De igual forma es posible incluir más observaciones en la solución y desechar las que sean dudosas.

2. *Notación.*

AHG = ángulo horario en Greenwich. El *AHG* varía desde 0° a 360° empieza sobre 0° en el meridiano de Greenwich incrementándose hacia el oeste, hasta volver a 360° sobre el meridiano de Greenwich.

AHS = ángulo horario sidéreo. El rango es de 0° a 360°.

Dec = declinación. Los signos convencionales para la declinación son positivo hacia el norte y negativo al sur. La *Dec* varía desde 0° en el ecuador celeste hasta −90° sobre el polo sur celeste y desde 0° en el ecuador celeste hasta +90° sobre el polo norte celeste.

Long = longitud. Los signos convencionales para la longitud son positivo hacia el este y negativo al oeste. La longitud varía desde 0° a +180° y de 0° a −180°.

Lat = latitud. Los signos convencionales para la Latitud son positivo hacia el norte y negativo al sur. La *Lat* varía desde 0° en el ecuador terrestre hasta +90° sobre el polo norte terrestre y desde 0° en el ecuador terrestre hasta −90° sobre el polo sur terrestre.

AHL = *AHG* + *Long* = ángulo horario local. El *AHL* se incrementa hacia el oeste, desde 0° sobre el Meridiano Local hasta 360°.

H_c = altura calculada. Sobre el horizonte es positiva, debajo del horizonte es negativa. La H_c varía desde 0° hasta −90° en el nadir y de 0° hasta +90° en el zenit.

H_s = altura del sextante.

H = altura aparente = altura del sextante corregida por error instrumental y depresión.

H_o = altura observada = altura aparente o corregida por refracción y en casos particulares, corregida por paralaje y semi-diámetro.

Z = Z_n= azimut verdadero. *Z* se mide a partir del norte verdadero a través del este, sur, oeste y de vuelta hacia el norte. El azimut varia desde 0° a 360°.

I = error de índice del sextante.

D = depresión del horizonte.

R = refracción atmosférica

PH = paralaje horizontal del Sol, Luna, Venus o Marte.

PA = paralaje por altura del Sol, Luna, Venus o Marte.

S = semi-diámetro del Sol o de la Luna.

p = intercepto = $H_o - H_c$. Hacia el astro es positivo, contrario es negativo.

T = rumbo o derrota, medido como azimut desde el norte.

V = velocidad en nudos.

3. *Datos Básicos de Entrada.* Cuando se introducen a la calculadora cantidades como el *A.H.G.*, los que en el *Almanaque Náutico* se dan en grados y minutos, convertidos a grados y décimas de un grado mediante la división de los minutos entre 60 y sumando a los grados; por ejemplo, si el $AHG = 123° 45'.6$, introduzca los dos números 123 y 45.6 en la memoria y determine $AHG = 123 + 45.6/60 = 123°.7600$. Aunque en los ejemplos se muestran cuatro cifras decimales de un grado, se supone que se mantiene la precisión completa dentro de la calculadora.

Cuando se usa una computadora o una calculadora programable, escribir una subrutina para convertir grados y minutos a grados y decimales. Las calculadoras científicas usualmente tienen una clave especial para este propósito. Para cantidades como la *Dec*; las cuales tienen un signo menos, con relación a las declinaciones meridionales o del sur, cambiar el signo de más (+) a menos (−), después de que el valor haya sido convertido a grados y decimales, *por ejemplo:* $Dec = 0° 12'.3\ S = 0°.2050\ S = -0°.2050$. Otras cantidades las cuales requieren conversión son: semi-diámetro, paralaje horizontal, longitud y latitud.

4. *Interpolación del AHG y Dec.* Los *AHG* y *Dec* del Sol, Luna y planetas, se interpolan a la hora de observación por cálculo directo como sigue: si el tiempo universal es $a^h\ b^m\ c^s$, ordenar el factor de interpolación $x = b/60 + c/3600$. Ingrese el valor tabular del AHG_0 (inicial) para la hora precedente (a) y el valor tabular de AHG_1 para la hora siguiente ($a+1$), entonces el valor interpolado del *AHG* está dado por:

$$AHG = AHG_0 + x\,(AHG_1 - AHG_0)$$

Si el *AHG* supera completamente 360° entre valores tabulares, adicionar 360° al AHG_1 antes de interpolar.
Si el valor interpolado excede de 360°, restar 360° de *AHG*.

De forma análoga, para la declinación introduzca el valor tabular Dec_0 (inicial) para la hora precedente (a) y el valor tabular Dec_1 para la hora siguiente ($a+1$), entonces el valor interpolado *Dec* está dado por:

$$Dec = Dec_0 + x\,(Dec_1 - Dec_0)$$

5. *Ejemplo.* (a) Encontrar el *AHG* y *Dec* del Sol el 24 de agosto del 2001, a las $1^h\ 57^m\ 44^s$ T.U.

El factor de interpolación de la página 167

$$\begin{aligned}
x &= 57/60 + 44/3600 = 0^h.9622 \\
1^h\ AHG_0 &= 194°\ 23'.3 = 194°.3883 \\
2^h\ AHG_1 &= 209°\ 23'.5 = 209°.3917 \\
1^h.9622\ AHG &= 194.3883 + 0.9622(209.3917 - 194.3883) = 208°.8249 \\
1^h\ Dec_0 &= 11°\ 08'.3\ N = -11°.1383 \\
2^h\ Dec_1 &= 11°\ 07'.4\ N = -11°.1233 \\
1^h.9622\ Dec &= -11.1383 + 0.9622(11.1233 - 11.1383) = +11°.1239
\end{aligned}$$

El *AHG* de Aries se interpola del mismo modo que el *AHG* de un astro. Para una estrella el *AHS* y la *Dec*, se toman de la página tabular y no se requiere interpolación, entonces:

$$AHG = AHG\ \text{Aries} + AHS$$

donde *AHG* Aries se interpola para la hora de observación.

(b) Encontrar el *AHG* y *Dec* de *Vega* el 24 de agosto del 2001, a $1^h\ 57^m\ 44^s$ T.U.
El factor de interpolación $x = 0^h.9622$ como en el ejemplo anterior

de la página 166

1^h *AHG* Aries$_0$ = 347° 22'.7 = 347°.3783
2^h *AHG* Aries$_1$ = 2° 25'.2 = 362°.4200 (sumando 360°)
1^h.9622 *AHG* Aries = 347.3783 + 0.9622 (362.4200 −347.3783) = 361°.8518
AHS = 80° 45'.0 = 80°.7500
AHG = *AHG* Aries + *AHS* = 82°.6018 (múltiplo de 360° restado)
Dec = 38° 47'.3 N = +38°.7883

6. *La altura calculada y azimut.* La altura calculada H_c y el azimut verdadero Z se determina conforme al *AHG* y la *Dec* interpolados para la hora de observación y según la *Long* y *Lat* estimadas en la hora de observación, como sigue:

Paso 1. Calcular el ángulo horario local

$$AHL = AHG + Long$$

Sumar o sustraer los múltiplos de 360° para encontrar el *AHL* en el rango de 0° a 360°

Paso 2. Calcular S, C y la altura H_c según

$$S = \text{sen } Dec$$
$$C = \cos Dec \cos AHL$$
$$H_c = \text{sen}^{-1} (S \text{ sen } Lat + C \cos Lat)$$

en donde sen^{-1} es la función inversa del seno.

Paso 3. Calcular X y A conforme:

$X = (S \cos Lat - C \text{ sen } Lat) / \cos H_c$
Si $X > +1$ entonces $X = +1$
Si $X < -1$ entonces $X = -1$
$A = \cos^{-1} X$

en donde $\cos^{-1}$ es la función inversa del coseno.

Paso 4. Determinar el azimut Z

Si $AHL > 180°$ entonces $Z = A$
De otra manera $Z = 360° - A$

7. *Ejemplo.* Encontrar la altura calculada H_c y el azimut Z cuando

$$AHG = 53° \quad Dec = 15° \text{ S} \quad Lat = 32° \text{ N} \quad Long = 16° \text{ W}$$

Para el cálculo

$$AHG = 53°.0000 \quad Dec = -15°.0000 \quad Lat = +32°.0000 \quad Long = -16°.0000$$

Paso 1. $AHL = 53.0000 - 16.0000 = 37.0000$
Paso 2. $S = -0.2588$
$C = +0.9659 \times 0.7986 = 0.7714$
$\text{sen } H_c = -0.2588 \times 0.5299 + 0.7714 \times 0.8480 = 0.5171$
$H_c = 31°.1346$
Paso 3. $X = (-0.2588 \times 0.8480 - 0.7714 \times 0.5299)/0.8560 = -0.7340$
$A = 137°.2239$
Paso 4. ya que $AHL \leq 180°$ entonces $Z = 360° - A = 222°.7761$

8. *Reducción de la altura del sextante a la altura observada.* La altura del sextante H_s es corregida por depresión y error de índice para obtener la altura aparente. La altura observada H_o es calculada aplicando la corrección por refracción. Para el Sol, Luna, Venus y Marte la corrección por paralaje es igualmente aplicada a H, y para el Sol y la Luna una corrección adicional por semi-diámetro son necesarias. Las correcciones se calculan del modo siguiente:

Paso 1. Calcular la depresión:

$$D = 0°.0293\sqrt{h}$$

en donde h es la altura del ojo sobre el horizonte en metros.

Paso 2. Calcular la altura aparente.

$$H = H_s + I - D$$

donde I es el error del índice del sextante.

Paso 3. Calcular la refracción (R) a la temperatura normal de 10° Celcius, (C) y a 1010 milibares (mb) de presión atmosférica

$$R_0 = 0°.0167 / \tan (H + 7.31 / (H + 4.4))$$

Si la temperatura $T°$ C y la presión atmosférica P mb son conocidas, calculando la refracción atmosférica conforme

$$R = f R_o \qquad \text{en donde} \quad f = 0.28P / (T + 273)$$

de otra manera $R = R_o$

Paso 4. Calcular el paralaje por altura (PA) según el paralaje horizontal (PH) y la altura aparente (H) del Sol, Luna, Venus y Marte como sigue:

$$PA = PH \cos H$$

El paralaje horizontal para el Sol PH = 0°.0024. Esta corrección es muy pequeña y puede ser ignorada.

El paralaje horizontal para la Luna PH se toma para la hora más cercana, según las tablas de las páginas diarias y convertida a grados.

Para Venus y Marte el paralaje horizontal PH, se toma de la tabla crítica, a la mitad de la página 259 y convertida a grados.

Para las estrellas de uso en navegación y los planetas restantes, Júpiter y Saturno establecer: $PA = 0$.

Si un error de 0'.2 es importante la expresión para el paralaje por altura para la Luna, debe de incluir una corrección pequeña OB por la curvatura de la Tierra como sigue:

$$PA = PH \cos H + OB$$

en donde $OB = -0°.0032 \operatorname{sen}^2 Lat \cos H + 0°.0032 \operatorname{sen}(2\,Lat) \cos Z \operatorname{sen} H$

En latitudes medias y para alturas de la Luna por debajo de los 60° una simple aproximación para OB es

$$OB = -0°.0017 \cos H$$

paso 5. Calcular el semi-diámetro para el Sol y la Luna como sigue:

Sol: S se toma de las páginas diarias (nones) y convertida a grados.

Luna: $S = 0°.2724\ PH$ en donde PH es tomado para la hora más cercana de la tabla en las páginas diarias y convertida a grados.

Paso 6. Calcular la altura observada

$$H_o = H - R + PA \pm S$$

en donde el signo positivo es usado en caso que fuese observado el Sol o la Luna con el limbo inferior y el signo negativo si se observa con el limbo superior.

9. *Ejemplo.* El siguiente ejemplo ilustra como utilizar una calculadora para reducir la altura del sextante (H_s) a la altura observada (H_o); las alturas con sextante dadas, se asume que fueron tomadas para utilizarse el 24 de agosto del 2001 con un sextante marino, el índice de error cero a una altura de 5.4 m, temperatura de −3° C y presión de 982 mb, las visuales a la Luna fueron tomadas a las 10^h T.U.

Astro Limbo	Sol inferior	Sol superior	Luna inferior	Luna superior	Venus —	*Polar* —
Altura del sextante: H_s	21.3283	3.3367	33.4600	26.1117	4.5433	49.6083
Paso 1. Depresión: $D = 0.0293\sqrt{h}$	0.0681	0.0681	0.0681	0.0681	0.0681	0.0681
Paso 2. Altura aparente: $H = H_s + I - D$	21.2602	3.2686	33.3919	26.0436	4.4752	49.5402
Paso 3. Refracción:						
R_o	0.0423	0.2262	0.0251	0.0338	0.1801	0.0142
f	1.0184	1.0184	1.0184	1.0184	1.0184	1.0184
$R = f R_o$	0.0431	0.2304	0.0256	0.0344	0.1834	0.0144
Paso 4. Paralaje:			(58′.1)	(58′1)	(0′.1)	
PH	0.0024	0.0024	0.9683	0.9683	0.0017	—
Paralaje por altura: $PA = PH \cos H$	0.0022	0.0024	0.7598	0.8176	0.0017	—
Paso 5. Semi-diámetro:						
Sol : $S = 15.8/60$	0.2633	0.2633	—	—	—	—
Luna : $S = 0.2724\ PH$	—	—	0.2638	0.2638	—	—
Paso 6. Altura Observada: $H_o = H - R + PA \pm S$	21.4827	2.7773	34.4386	26.6154	4.2935	49.5258

Nótese que para la Luna la corrección por curvatura de la Tierra de aproximadamente −0°.0017 cos H, lo cual es equivalente a −0°.0014 para el limbo inferior y −0°.0015 para el limbo superior, ha sido ignorado en los cálculos anteriores.

10. *Posición por intercepto y azimut usando una carta.* Se hace una estimación de la posición a la hora asumida para la fija. La posición a la hora de observación es por ésta razón calculada por estima, conforme la hora de la fija. Por ejemplo si el rumbo (derrota) T y la velocidad V (en nudos) del observador son constantes entonces la *Long* y la *Lat* para la hora de observación son calculados por:

$$Long = L_F + t\,(V/60)\ \text{sen}\ T / \cos B_F$$
$$Lat = B_F + t\,(V/60)\cos T$$

en donde L_F y B_F son la longitud y la latitud estimada para la hora de la fija y t es el intervalo de tiempo en horas, de la hora de la fija, a la hora de observación, t es positivo, si la hora de la observación es posterior a la hora de la fija y negativo si es anterior.

La línea de posición de una observación es trazada en una carta usando el intercepto:

$$p = H_o - H_c$$

y el azimut Z con origen en la posición calculada (*Long*, *Lat)* a la hora de observación, en donde H_c y Z son calculadas usando el método de la sección 6, página 285. Empezando a dibujar una línea en la carta desde esta posición calculada en la dirección del azimut hacia el astro. Convertir p a millas náuticas multiplicándolo por 60. La línea de posición es trazada perpendicularmente a la línea de azimut; la distancia p de (*Long* y *Lat*), hacia el astro si p es positiva y contra el astro si p es negativa. Siempre que no haya grandes errores el navegante debe de estar en algún lugar sobre o cerca de la línea de posición a la hora de observación. Dos o más trazos de posición son necesarios para determinar una fija.

11. *Posición por intercepto y azimut por cálculo.* La posición de la fija puede ser calculada de dos o más observaciones con sextante como sigue:

Si p_1, Z_1, son el intercepto y el azimut de la primera observación; p_2 , Z_2 , de la segunda observación y así sucesivamente, tenemos:

$$A = \cos^2 Z_1 + \cos^2 Z_2 + \ldots$$
$$B = \cos Z_1 \operatorname{sen} Z_1 + \cos Z_2 \operatorname{sen} Z_2 + \ldots$$
$$C = \operatorname{sen}^2 Z_1 + \operatorname{sen}^2 Z_2 + \ldots$$
$$D = p_1 \cos Z_1 + p_2 \cos Z_2 + \ldots$$
$$E = p_1 \operatorname{sen} Z_1 + p_2 \operatorname{sen} Z_2 + \ldots$$

en donde el número de términos de cada suma es igual al número de observaciones.

Con $G = A\,C - B^2$, una estimación corregida de la posición a la hora de la fija (L_I , B_I) está dada por:

$$L_I = L_F + (A\,E - B\,D)/(G \cos B_F), \qquad B_I = B_F + (C\,D - B\,E)/G$$

Calcular la distancia d entre la posición inicial estimada (L_F , B_F) a la hora de la fija y la posición estimada corregida (L_I , B_I) en millas náuticas según:

$$d = 60\sqrt{\left(\left(L_I - L_F\right)^2 \cos^2 B_F + \left(B_I - B_F\right)^2\right)}$$

Si d supera alrededor de 20 millas náuticas establecer $L_F = L_I$, $B_F = B_I$ y repetir el cálculo hasta que d, la distancia entre la posición anterior y la estimación corregida sea menos que alrededor de 20 millas náuticas.

12. *Ejemplos de cálculo directo.* Usando el método descrito, calcular la posición de una embarcación el 19 de junio del 2001 a las $21^h\,00^m\,00^s$ T.U. conforme a las observaciones obtenidas con el sextante marino de las tres estrellas: *Regulus* (No. 26) a las $20^h\,39^m\,23^s$ T.U.; *Antares* (No. 42) a las $20^h\,45^m\,47^s$ T.U. y *Kochab* (No. 40) a las $21^h\,10^m\,34^s$ T.U.; en donde las alturas observadas de las tres estrellas corregidas por los efectos de refracción, depresión y error instrumental son: 39°.2749, 19°.1284 y 47°.0674 respectivamente. La embarcación viajaba a una velocidad constante de 20 nudos sobre un rumbo (o derrota) de 325° durante el período de observación, y la posición de la embarcación a la hora de la fija $21^h\,00^m\,00^s$ T.U., es solo conocida al grado entero más próximo, 15° W y 32° N.

Los valores intermedios para la primera iteración se muestran en la tabla. El *AHG* de Aries es interpolado según los valores tabulares más próximos en la página No. 122. Para el primer conjunto de iteración asignar: $L_F = -15°.0000$, $B_F = +32°.0000$ siendo la hora de la fija $21^h\,00^m\,00^s$ T.U.

Primera Iteración

Astro	*Regulus*	*Antares*	*Kochab*
No	26	42	40
Hora de observación	$20^h\ 39^m\ 23^s$	$20^h\ 45^m\ 47^s$	$21^h\ 10^m\ 34^s$
H_o	39.2749	19.1284	47.0674
factor de interpolación	0.6564	0.7631	0.1761
AHG de Aries	217.9788	219.5830	225.7957
AHS (pág. 122)	207.8950	112.6250	137.3117
AHG	65.8738	332.2080	3.1073
Dec (pág. 122)	+11.9617	−26.4350	+74.1550
t	−0.3436	−0.2369	+0.1761
Long	−14.9225	−14.9466	−15.0397
Lat	+31.9062	+31.9353	+32.0481
Z	258.8467	140.0567	4.7902
H_c	39.2518	18.8226	47.4675
p	+0.0231	+0.3058	−0.4001

$$A = 1.6182 \quad B = -0.2192 \quad C = 1.3818 \quad D = -0.6376 \quad E = 0.1403 \quad G = 2.1880$$
$$(A\,E - BD)\,/\,(G\cos B_F) = +0.0470, \quad (CD - BE)/G = -0.3886$$

Una estimación rectificada de la posición a la hora de la fija es:

$$L_I = L_F + 0.0470 = -14.9530 \quad \text{y} \quad B_I = B_F - 0.3886 = +31.6114$$

Puesto que la distancia entre la posición estimada previa y la estimación rectificada: $d = 23.4$ millas náuticas, asignar $L_F = -14.9530$ y $B_F = +31.6114$ y repetir el cálculo. La tabla muestra los valores intermedios del cálculo para la segunda iteración. En cada iteración las cantidades H_o, *AHG*, *Dec* y t no cambia.

Segunda Iteración

Astro	*Regulus*	*Antares*	*Kochab*
No.	26	42	40
Long	−14.8759	−14.8998	−14.9926
Lat	+31.5176	+31.5467	+31.6595
Z	259.1893	140.0059	4.7370
H_c	39.2869	19.1460	47.0836
p	−0.0120	−0.0176	−0.0161

$$A = 1.6153 \quad B = -0.2259 \quad C = 1.3847 \quad D = -0.0004 \quad E = -0.0009 \quad G = 2.1857$$

$$(AE - BD)/(G\cos B_F) = -0.0008, \quad (CD - BE)/G = -0.0003$$

Una estimación rectificada de la posición a la hora de la fija es:

$$L_I = L_F - 0.0008 = -14.9538 \quad \text{y} \quad B_I = B_F - 0.0003 = +31.6110$$

La distancia entre la posición estimada previa y la estimación de la posición rectificada es $d = 0.05$ millas náuticas, es tan pequeña de tal manera que una tercera iteración, produciría una cantidad despreciable, para la estimación de la posición.

PROCEDIMIENTO DE REDUCCIÓN DE VISUALES

USO DE LAS TABLAS ABREVIADAS DE REDUCCIÓN DE VISUALES

1. *Introducción.* Las tablas abreviadas de reducción de visuales dadas en las páginas 295 a 326 tienen la intención de ser usadas cuando no están disponibles tablas más extensas o ningún instrumento electrónico de cálculo. Estas "tablas de reducción de visuales", permiten la reducción del ángulo horario local y la declinación de un astro celeste, a azimut y altura, referidas a una posición asumida sobre la superficie de la tierra, para su uso en el método de interceptos de la navegación celeste, el cual es ahora una práctica normal.

2. *Formato de las tablas.* Los valores en la tabla de reducción están a intervalos fijos de un grado para las latitudes y ángulos horarios. Esta disposición concisa es resultado de la división del triángulo de navegación en dos triángulos esféricos rectos, de modo que debe entrarse dos veces a la tabla. Los argumentos para entrar la primera vez son la latitud asumida y el ángulo horario local. La tabla de reducción responde con los argumentos intermedios A, B y Z_1, en donde A es usado como uno de los argumentos para la segunda entrada a la tabla, B debe ser incrementado con la declinación para producir la cantidad F, y Z_1 es un componente del ángulo azimutal. En consecuencia se vuelve a entrar a la tabla de reducción con A y F; y producir H, P y Z_2 en donde H es la altura; P es el complemento del ángulo paraláctico y Z_2 es el segundo componente del ángulo azimutal. Usualmente es necesario ajustar la altura tabular por las partes fraccionarias de los argumentos intermedios de entrada para reducir la altura calculada, y se proporciona una tabla auxiliar para la resolución. Las reglas que rigen los signos de las cantidades; las cuales deben adicionarse o restarse, están indicadas en las instrucciones y resumidas encima de cada página tabulada. El ángulo azimutal es la suma de dos componentes y se convierte a azimut verdadero por medio de las reglas conocidas, reiteradas al pie de las páginas tabuladas.

La altura tabular y cantidades intermedias están indicadas al minuto del arco más próximo, aunque se pueden acumular errores de 2′ en la altura calculada durante el ajuste por los fragmentos de minutos de los argumentos de entrada. Los componentes del ángulo azimutal están expresados al décimo de grado 0°.1; para deducir el azimut verdadero, solamente se requieren a grados enteros. Puesto que es difícil observar astros cercanos al cenit con un sextante marino, estos deben evitarse; alturas mayores de 80° no son convenientes para reducir por éste método.

En la mayoría de las circunstancias la exactitud proporcionada por estas tablas es suficiente. Sin embargo, para mantener la mayor precisión (0′.1) de los datos efeméricos del almanaque durante todas sus reducciones para la altura y azimut, se deberán usar tablas más extensas o una calculadora.

3. *Uso de las tablas*

Paso 1. Determinar el ángulo horario de Greenwich (*AHG*) y la Declinación (*Dec*) del astro del Almanaque. Seleccione una latitud asumida (*Lat*) de grados enteros, la más próxima a la latitud estimada. Escoger una longitud asumida cercana a la longitud estimada tal que el ángulo horario local

$$AHL = AHG \begin{matrix} - \text{ longitud al oeste} \\ + \text{ longitud al este} \end{matrix}$$

quede expresado en grados enteros.

Paso 2. Entrar a la tabla de reducción con *Lat* y *AHL* como argumentos. Anotar las cantidades A, B y Z_1. Aplicar las reglas de los signos de B y Z_1 : B es negativa si $90° < AHL < 270°$; Z_1 tendrá el mismo signo, al igual que B. Asignar $A°$ = al grado entero más próximo de A y A' = la parte de los minutos de A. Este paso puede ser repetido para todas las reducciones antes de dejar la latitud de apertura de la tabla.

Paso 3. Anotar la declinación *Dec*. Aplicar la regla para el signo de *Dec*: *Dec* es negativa, si la especificación de *Dec* (*por ejem.* N o S) es contraria a la latitud. Sumar *B* y la *Dec* algebraicamente para obtener *F*. Si *F* es negativa, el astro está por debajo del horizonte (en la reducción de visuales, esto puede ocurrir cuando los astros están cerca del horizonte). Considerar *F* como positivo hasta el paso 7. Asignar $F°$ = al grado entero más próximo de *F* y F' = la parte de los minutos de *F*.

Paso 4. Entrar a la tabla de reducción una segunda vez con $A°$ y $F°$ como argumentos y anotar *H*, *P* y Z_2. Asignar $P°$ = al grado entero más próximo a *P* y $Z_2°$ = al grado entero inmediato a Z_2.

Paso 5. Entrar a la tabla auxiliar con F' y $P°$ como argumento para obtener la $corr_1$ de *H* para F'. Aplicar la regla al signo de $corr_1$: $corr_1$ es negativo si $F < 90°$ y $F' > 29'$ o si $F > 90°$ y $F' < 30'$, de lo contrario $corr_1$ es positivo.

Paso 6. Entrar a la tabla auxiliar con A' y $Z_2°$ como argumentos para obtener la $corr_2$ de *H* para A'. Aplicar la regla al signo de $corr_2$: $corr_2$ es menos si $A' < 30'$, de lo contrario $corr_2$ es positivo.

Paso 7. Calcular la altura computada H_c como la suma de *H*, $corr_1$ y $corr_2$. Aplicar la regla para el signo de H_c: H_c es menor, si *F* es negativa.

Paso 8. Aplicar la regla de los signos de Z_2 : Z_2 es menos si $F > 90°$. Si *F* es negativo, sustituir Z_2 por $180° - Z_2$. Asignar el ángulo azimutal *Z*, igual a la suma algebraica de Z_1 y Z_2 e ignore el signo resultante. Obtener el azimut verdadero Z_n conforme a las reglas siguientes:

Para latitud N,	si	$AHL > 180°$	$Z_n = Z$
	si	$AHL < 180°$	$Z_n = 360° - Z$
Para latitud S,	si	$AHL > 180°$	$Z_n = 180° - Z$
	si	$AHL < 180°$	$Z_n = 180° + Z$

La altura observada H_o es comparada con H_c para obtener la diferencia de altura, la cual con Z_n son utilizados para trazar la línea de posición.

4. *Ejemplo.* (a) Obtener la altura y el azimut de *Schedar* para el 5 de febrero del 2001 a las $6^h\ 30^m$ T.U., de la posición estimada 4° este y 53° norte.

1. Latitud asumida	*Lat* =	53° N		
conforme al Almanaque	*AHG* =	222° 50′		
Longitud asumida		4° 10′ E		
Ángulo Horario Local	*AHL* =	227		
2. Primera entrada a la tabla de reducción				
(*Lat*, *AHL*) = (53, 227)	*A* =	26 07	$A° = 26, A' = 7$	
	B =	−27 12	$Z_1 = -49.4$,	$90° < AHL < 270°$
3. Conforme al almanaque	*Dec* =	+56 33		*Lat* y *Dec* semejantes
Suma = *B* + *Dec*	*F* =	+29 21	$F° = 29, F' = 21$	
4. Segunda entrada a la tabla de reducción				
($A°$, $F°$) = (26, 29)	*H* =	25 50	$P° = 61$	
			$Z_2 = 76.3$	
5. Primera entrada a la tabla auxiliar				
(F', $P°$) = (20, 61)	$corr_1$ =	+18		$F < 90°, F' < 29'$
Suma		26 08		

6. Segunda entrada a la tabla auxiliar $(A', Z_2°) = (7, 76)$	$corr_2 =$	$A' < 30'$
7. Suma = altura calculada	$H_c =$ +26° 06′	$F > 0°$
8. Azimut, primer componente	$Z_1 =$ −49.4	mismo signo que B
segundo componente	$Z_2 =$ +76.3	$F < 90°, F > 0°$
Suma = ángulo azimutal	$Z =$ 26.9	
Azimut verdadero	$Z_n =$ 027°	*Lat* N, $AHL > 180°$

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TABLAS ABREVIADAS PARA REDUCCIÓN DE VISUALES

B: (–) para 90°< AHL< 270°
Dec: (–) para la Lat. con signo contrario

TABLA PARA REDUCCION DE VISUALES

Z_1: mismo signo que B
Z_2: (–) para F > 90°

Lat. / A	0°			1°			2°			3°			4°			5°			Lat. / A
AHL / F	A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	AHL
° °	° ′	° ′	°	° ′	° ′	°	° ′	° ′	°	° ′	° ′	°	° ′	° ′	°	° ′	° ′	°	° °
0 180	0 00	90 00	90.0	0 00	89 00	90.0	0 00	88 00	90.0	0 00	87 00	90.0	0 00	86 00	90.0	0 00	85 00	90.0	180 360
1 179	1 00	90 00	90.0	1 00	89 00	90.0	1 00	88 00	90.0	1 00	87 00	89.9	1 00	86 00	89.9	1 00	85 00	89.9	181 359
2 178	2 00	90 00	90.0	2 00	89 00	90.0	2 00	88 00	89.9	2 00	87 00	89.9	2 00	86 00	89.9	2 00	85 00	89.8	182 358
3 177	3 00	90 00	90.0	3 00	89 00	89.9	3 00	88 00	89.9	3 00	87 00	89.8	3 00	86 00	89.8	2 59	85 00	89.7	183 357
4 176	4 00	90 00	90.0	4 00	89 00	89.9	4 00	88 00	89.9	4 00	87 00	89.8	3 59	85 59	89.7	3 59	84 59	89.7	184 356
5 175	5 00	90 00	90.0	5 00	89 00	89.9	5 00	88 00	89.8	5 00	86 59	89.7	4 59	85 59	89.7	4 59	84 59	89.6	185 355
6 174	6 00	90 00	90.0	6 00	89 00	89.9	6 00	87 59	89.8	6 00	86 59	89.7	5 59	85 59	89.6	5 59	84 58	89.5	186 354
7 173	7 00	90 00	90.0	7 00	89 00	89.9	7 00	87 59	89.8	6 59	86 59	89.6	6 59	85 58	89.5	6 58	84 58	89.4	187 353
8 172	8 00	90 00	90.0	8 00	88 59	89.9	8 00	87 59	89.7	7 59	86 58	89.6	7 59	85 58	89.4	7 58	84 57	89.3	188 352
9 171	9 00	90 00	90.0	9 00	88 59	89.8	9 00	87 59	89.7	8 59	86 58	89.5	8 59	85 57	89.4	8 58	84 56	89.2	189 351
10 170	10 00	90 00	90.0	10 00	88 59	89.8	10 00	87 58	89.6	9 59	86 57	89.5	9 59	85 56	89.3	9 58	84 55	89.1	190 350
11 169	11 00	90 00	90.0	11 00	88 59	89.8	11 00	87 58	89.6	10 59	86 57	89.4	10 58	85 56	89.2	10 57	84 54	89.0	191 349
12 168	12 00	90 00	90.0	12 00	88 59	89.8	12 00	87 57	89.6	11 59	86 56	89.4	11 58	85 55	89.2	11 57	84 53	88.9	192 348
13 167	13 00	90 00	90.0	13 00	88 58	89.8	13 00	87 57	89.5	12 59	86 55	89.3	12 58	85 54	89.1	12 57	84 52	88.8	193 347
14 166	14 00	90 00	90.0	14 00	88 58	89.8	13 59	87 56	89.5	13 59	86 54	89.3	13 58	85 53	89.0	13 57	84 51	88.8	194 346
15 165	15 00	90 00	90.0	15 00	88 58	89.7	14 59	87 56	89.5	14 59	86 54	89.2	14 58	85 52	88.9	14 56	84 49	88.7	195 345
16 164	16 00	90 00	90.0	16 00	88 58	89.7	15 59	87 55	89.4	15 59	86 53	89.1	15 58	85 50	88.9	15 56	84 48	88.6	196 344
17 163	17 00	90 00	90.0	17 00	88 57	89.7	16 59	87 55	89.4	16 59	86 52	89.1	16 57	85 49	88.8	16 56	84 46	88.5	197 343
18 162	18 00	90 00	90.0	18 00	88 57	89.7	17 59	87 54	89.4	17 58	86 51	89.0	17 57	85 48	88.7	17 56	84 45	88.4	198 342
19 161	19 00	90 00	90.0	19 00	88 57	89.7	18 59	87 53	89.3	18 58	86 50	89.0	18 57	85 46	88.6	18 55	84 43	88.3	199 341
20 160	20 00	90 00	90.0	20 00	88 56	89.6	19 59	87 52	89.3	19 58	86 48	88.9	19 57	85 45	88.5	19 55	84 41	88.2	200 340
21 159	21 00	90 00	90.0	21 00	88 56	89.6	20 59	87 51	89.2	20 58	86 47	88.8	20 57	85 43	88.5	20 55	84 39	88.1	201 339
22 158	22 00	90 00	90.0	22 00	88 55	89.6	21 59	87 51	89.2	21 58	86 46	88.8	21 57	85 41	88.4	21 55	84 37	88.0	202 338
23 157	23 00	90 00	90.0	23 00	88 55	89.6	22 59	87 50	89.2	22 58	86 44	88.7	22 56	85 39	88.3	22 54	84 34	87.9	203 337
24 156	24 00	90 00	90.0	24 00	88 54	89.6	23 59	87 49	89.1	23 58	86 43	88.7	23 56	85 37	88.2	23 54	84 32	87.8	204 336
25 155	25 00	90 00	90.0	25 00	88 54	89.5	24 59	87 48	89.1	24 58	86 41	88.6	24 56	85 35	88.1	24 54	84 29	87.7	205 335
26 154	26 00	90 00	90.0	26 00	88 53	89.5	25 59	87 46	89.0	25 58	86 40	88.5	25 56	85 33	88.1	25 54	84 26	87.6	206 334
27 153	27 00	90 00	90.0	27 00	88 53	89.5	26 59	87 45	89.0	26 58	86 38	88.5	26 56	85 31	88.0	26 53	84 24	87.5	207 333
28 152	28 00	90 00	90.0	28 00	88 52	89.5	27 59	87 44	88.9	27 57	86 36	88.4	27 56	85 28	87.9	27 53	84 20	87.3	208 332
29 151	29 00	90 00	90.0	29 00	88 51	89.4	28 59	87 43	88.9	28 57	86 34	88.3	28 55	85 26	87.8	28 53	84 17	87.2	209 331
30 150	30 00	90 00	90.0	30 00	88 51	89.4	29 59	87 41	88.8	29 57	86 32	88.3	29 55	85 23	87.7	29 52	84 14	87.1	210 330
31 149	31 00	90 00	90.0	31 00	88 50	89.4	30 59	87 40	88.8	30 57	86 30	88.2	30 55	85 20	87.6	30 52	84 10	87.0	211 329
32 148	32 00	90 00	90.0	32 00	88 49	89.4	31 59	87 39	88.8	31 57	86 28	88.1	31 55	85 17	87.5	31 52	84 07	86.9	212 328
33 147	33 00	90 00	90.0	33 00	88 48	89.4	32 59	87 37	88.7	32 57	86 25	88.1	32 55	85 14	87.4	32 52	84 03	86.8	213 327
34 146	34 00	90 00	90.0	34 00	88 48	89.3	33 59	87 35	88.7	33 57	86 23	88.0	33 54	85 11	87.3	33 51	83 59	86.6	214 326
35 145	35 00	90 00	90.0	35 00	88 47	89.3	34 59	87 34	88.6	34 57	86 20	87.9	34 54	85 07	87.2	34 51	83 54	86.5	215 325
36 144	36 00	90 00	90.0	36 00	88 46	89.3	35 58	87 32	88.5	35 57	86 18	87.8	35 54	85 04	87.1	35 51	83 50	86.4	216 324
37 143	37 00	90 00	90.0	37 00	88 45	89.2	36 58	87 30	88.5	36 56	86 15	87.7	36 54	85 00	87.0	36 50	83 45	86.2	217 323
38 142	38 00	90 00	90.0	38 00	88 44	89.2	37 58	87 28	88.4	37 56	86 12	87.7	37 53	84 56	86.9	37 50	83 40	86.1	218 322
39 141	39 00	90 00	90.0	39 00	88 43	89.2	38 58	87 26	88.4	38 56	86 09	87.6	38 53	84 52	86.8	38 49	83 35	86.0	219 321
40 140	40 00	90 00	90.0	40 00	88 42	89.2	39 58	87 23	88.3	39 56	86 05	87.5	39 53	84 47	86.7	39 49	83 29	85.8	220 320
41 139	41 00	90 00	90.0	41 00	88 40	89.1	40 58	87 21	88.3	40 56	86 02	87.4	40 53	84 42	86.5	40 49	83 23	85.7	221 319
42 138	42 00	90 00	90.0	42 00	88 39	89.1	41 58	87 19	88.2	41 56	85 58	87.3	41 52	84 37	86.4	41 48	83 17	85.5	222 318
43 137	43 00	90 00	90.0	43 00	88 38	89.1	42 58	87 16	88.1	42 56	85 54	87.2	42 52	84 32	86.3	42 48	83 11	85.4	223 317
44 136	44 00	90 00	90.0	43 59	88 37	89.0	43 58	87 13	88.1	43 55	85 50	87.1	43 52	84 27	86.1	43 47	83 04	85.2	224 316
45 135	45 00	90 00	90.0	44 59	88 35	89.0	44 58	87 10	88.0	44 55	85 46	87.0	44 52	84 21	86.0	44 47	82 57	85.0	225 315

Lat. / A		0°			1°			2°			3°			4°			5°			Lat. / A	
AHL/F		A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	AHL	
°	°	° ′	° ′	°	° ′	° ′	°	° ′	° ′	°	° ′	° ′	°	° ′	° ′	°	° ′	° ′	°	°	°
45	135	45 00	90 00	90.0	44 59	88 35	89.0	44 58	87 10	88.0	44 55	85 46	87.0	44 52	84 21	86.0	44 47	82 57	85.0	225	315
46	134	46 00	90 00	90.0	45 59	88 34	89.0	45 58	87 07	87.9	45 55	85 41	86.9	45 51	84 15	85.9	45 46	82 49	84.8	226	314
47	133	47 00	90 00	90.0	46 59	88 32	88.9	46 58	87 04	87.9	46 55	85 36	86.8	46 51	84 09	85.7	46 46	82 41	84.7	227	313
48	132	48 00	90 00	90.0	47 59	88 30	88.9	47 58	87 01	87.8	47 55	85 31	86.7	47 51	84 02	85.6	47 46	82 33	84.5	228	312
49	131	49 00	90 00	90.0	48 59	88 29	88.8	48 58	86 57	87.7	48 55	85 26	86.6	48 50	83 55	85.4	48 45	82 24	84.3	229	311
50	130	50 00	90 00	90.0	49 59	88 27	88.8	49 58	86 53	87.6	49 54	85 20	86.4	49 50	83 47	85.2	49 44	82 15	84.1	230	310
51	129	51 00	90 00	90.0	50 59	88 25	88.8	50 57	86 49	87.5	50 54	85 14	86.3	50 50	83 40	85.1	50 44	82 05	83.9	231	309
52	128	52 00	90 00	90.0	51 59	88 23	88.7	51 57	86 45	87.4	51 54	85 08	86.2	51 49	83 31	84.9	51 43	81 55	83.6	232	308
53	127	53 00	90 00	90.0	52 59	88 20	88.7	52 57	86 41	87.3	52 54	85 01	86.0	52 49	83 22	84.7	52 43	81 44	83.4	233	307
54	126	54 00	90 00	90.0	53 59	88 18	88.6	53 57	86 36	87.2	53 54	84 54	85.9	53 49	83 13	84.5	53 42	81 32	83.2	234	306
55	125	55 00	90 00	90.0	54 59	88 15	88.6	54 57	86 31	87.1	54 53	84 47	85.7	54 48	83 03	84.3	54 41	81 20	82.9	235	305
56	124	56 00	90 00	90.0	55 59	88 13	88.5	55 57	86 26	87.0	55 53	84 39	85.6	55 48	82 52	84.1	55 41	81 06	82.6	236	304
57	123	57 00	90 00	90.0	56 59	88 10	88.5	56 57	86 20	86.9	56 53	84 30	85.4	56 47	82 41	83.9	56 40	80 52	82.4	237	303
58	122	58 00	90 00	90.0	57 59	88 07	88.4	57 57	86 14	86.8	57 52	84 21	85.2	57 47	82 29	83.6	57 39	80 38	82.1	238	302
59	121	59 00	90 00	90.0	58 59	88 04	88.3	58 57	86 07	86.7	58 52	84 11	85.0	58 46	82 16	83.4	58 38	80 22	81.7	239	301
60	120	60 00	90 00	90.0	59 59	88 00	88.3	59 56	86 00	86.5	59 52	84 01	84.8	59 46	82 02	83.1	59 37	80 04	81.4	240	300
61	119	61 00	90 00	90.0	60 59	87 56	88.2	60 56	85 53	86.4	60 52	83 50	84.6	60 45	81 48	82.8	60 37	79 46	81.1	241	299
62	118	62 00	90 00	90.0	61 59	87 52	88.1	61 56	85 45	86.2	61 51	83 38	84.4	61 44	81 32	82.5	61 36	79 27	80.7	242	298
63	117	63 00	90 00	90.0	62 59	87 48	88.0	62 56	85 36	86.1	62 51	83 25	84.1	62 44	81 15	82.2	62 35	79 06	80.3	243	297
64	116	64 00	90 00	90.0	63 59	87 43	88.0	63 56	85 27	85.9	63 50	83 11	83.9	63 43	80 56	81.9	63 33	78 43	79.9	244	296
65	115	65 00	90 00	90.0	64 59	87 38	87.9	64 56	85 17	85.7	64 50	82 56	83.6	64 42	80 36	81.5	64 32	78 18	79.4	245	295
66	114	66 00	90 00	90.0	65 59	87 33	87.8	65 55	85 06	85.5	65 49	82 39	83.3	65 41	80 15	81.1	65 31	77 52	78.9	246	294
67	113	67 00	90 00	90.0	66 59	87 26	87.6	66 55	84 54	85.3	66 49	82 22	83.0	66 40	79 51	80.7	66 29	77 23	78.4	247	293
68	112	68 00	90 00	90.0	67 59	87 20	87.5	67 55	84 40	85.1	67 48	82 02	82.6	67 39	79 26	80.2	67 28	76 51	77.8	248	292
69	111	69 00	90 00	90.0	68 59	87 13	87.4	68 55	84 26	84.8	68 48	81 41	82.2	68 38	78 57	79.7	68 26	76 17	77.2	249	291
70	110	70 00	90 00	90.0	69 59	87 05	87.3	69 54	84 10	84.5	69 47	81 17	81.8	69 37	78 27	79.2	69 25	75 39	76.5	250	290
71	109	71 00	90 00	90.0	70 58	86 56	87.1	70 54	83 53	84.2	70 46	80 51	81.4	70 36	77 53	78.5	70 23	74 57	75.8	251	289
72	108	72 00	90 00	90.0	71 58	86 46	86.9	71 54	83 33	83.9	71 46	80 22	80.8	71 35	77 15	77.9	71 20	74 12	75.0	252	288
73	107	73 00	90 00	90.0	72 58	86 35	86.7	72 53	83 11	83.5	72 45	79 50	80.3	72 33	76 33	77.1	72 18	73 20	74.1	253	287
74	106	74 00	90 00	90.0	73 58	86 22	86.5	73 53	82 47	83.1	73 44	79 14	79.7	73 31	75 46	76.3	73 15	72 23	73.1	254	286
75	105	75 00	90 00	90.0	74 58	86 08	86.3	74 52	82 19	82.6	74 43	78 33	78.9	74 29	74 53	75.4	74 12	71 19	72.0	255	285
76	104	76 00	90 00	90.0	75 58	85 52	86.0	75 52	81 47	82.0	75 41	77 47	78.1	75 27	73 53	74.4	75 09	70 07	70.7	256	284
77	103	77 00	90 00	90.0	76 58	85 34	85.7	76 51	81 11	81.4	76 40	76 53	77.2	76 25	72 44	73.2	76 05	68 45	69.3	257	283
78	102	78 00	90 00	90.0	77 58	85 12	85.3	77 50	80 28	80.7	77 38	75 51	76.2	77 22	71 25	71.8	77 01	67 11	67.7	258	282
79	101	79 00	90 00	90.0	78 57	84 46	84.9	78 49	79 38	79.8	78 36	74 38	74.9	78 18	69 52	70.3	77 56	65 22	65.8	259	281
80	100	80 00	90 00	90.0	79 57	84 16	84.3	79 48	78 38	78.8	79 34	73 12	73.5	79 14	68 04	68.4	78 50	63 16	63.7	260	280
81	99	81 00	90 00	90.0	80 57	83 38	83.7	80 47	77 25	77.6	80 31	71 29	71.7	80 09	65 55	66.2	79 43	60 47	61.2	261	279
82	98	82 00	90 00	90.0	81 56	82 51	82.9	81 45	75 55	76.1	81 28	69 22	69.6	81 04	63 19	63.6	80 34	57 51	58.2	262	278
83	97	83 00	90 00	90.0	82 56	81 51	81.9	82 43	74 01	74.1	82 23	66 44	66.9	81 57	60 09	60.4	81 24	54 20	54.6	263	277
84	96	84 00	90 00	90.0	83 55	80 31	80.6	83 41	71 32	71.6	83 18	63 22	63.5	82 48	56 13	56.4	82 12	50 04	50.3	264	276
85	95	85 00	90 00	90.0	84 54	78 40	78.7	84 37	68 10	68.3	84 10	58 59	59.1	83 36	51 16	51.4	82 56	44 53	45.1	265	275
86	94	86 00	90 00	90.0	85 53	75 57	76.0	85 32	63 24	63.5	85 00	53 05	53.2	84 21	44 56	45.1	83 36	38 34	38.7	266	274
87	93	87 00	90 00	90.0	86 50	71 33	71.6	86 24	56 17	56.3	85 45	44 58	45.0	85 00	36 49	36.9	84 10	30 53	31.0	267	273
88	92	88 00	90 00	90.0	87 46	63 26	63.4	87 10	44 59	45.0	86 24	33 40	33.7	85 32	26 31	26.6	84 37	21 45	21.8	268	272
89	91	89 00	90 00	90.0	88 35	45 00	45.0	87 46	26 33	26.6	86 50	18 25	18.4	85 53	14 01	14.0	84 54	11 17	11.3	269	271
90	90	90 00	0 00	0.0	89 00	0 00	0.0	88 00	0 00	0.0	87 00	0 00	0.0	86 00	0 00	0.0	85 00	0 00	0.0	270	270

Lat. N.: para AHL >180°... $Z_n = Z$
para AHL < 180°... $Z_n = 360° - Z$

Lat. S.: para AHL > 180°... $Z_n = 180° - Z$
para AHL < 180°... $Z_n = 180° + Z$

B : (–) para 90° < AHL < 270°
Dec : (–) para la Lat. con signo contrario

TABLA PARA REDUCCION DE VISUALES

Z_1 : mismo signo que B
Z_2 : (–) para F > 90°

Lat. / A		6°			7°			8°			9°			10°			11°			Lat. / A	
AHL / F		A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	AHL	
°	°	° ′	° ′	°	° ′	° ′	°	° ′	° ′	°	° ′	° ′	°	° ′	° ′	°	° ′	° ′	°	°	°
0	180	0 00	84 00	90.0	0 00	83 00	90.0	0 00	82 00	90.0	0 00	81 00	90.0	0 00	80 00	90.0	0 00	79 00	90.0	180	360
1	179	1 00	84 00	89.9	1 00	83 00	89.9	0 59	82 00	89.9	0 59	81 00	89.8	0 59	80 00	89.8	0 59	79 00	89.8	181	359
2	178	1 59	84 00	89.8	1 59	83 00	89.8	1 59	82 00	89.7	1 59	81 00	89.7	1 58	80 00	89.7	1 58	79 00	89.6	182	358
3	177	2 59	84 00	89.7	2 59	82 59	89.6	2 58	81 59	89.6	2 58	80 59	89.5	2 57	79 59	89.5	2 57	78 59	89.4	183	357
4	176	3 59	83 59	89.6	3 58	82 59	89.5	3 58	81 59	89.4	3 57	80 59	89.4	3 56	79 59	89.3	3 56	78 58	89.2	184	356
5	175	4 58	83 59	89.5	4 58	82 58	89.4	4 57	81 58	89.3	4 56	80 58	89.2	4 55	79 58	89.1	4 54	78 58	89.0	185	355
6	174	5 58	83 58	89.4	5 57	82 58	89.3	5 56	81 57	89.2	5 56	80 57	89.1	5 55	79 57	89.0	5 53	78 56	88.9	186	354
7	173	6 58	83 57	89.3	6 57	82 57	89.1	6 56	81 56	89.0	6 55	80 56	88.9	6 54	79 56	88.8	6 52	78 55	88.7	187	353
8	172	7 57	83 56	89.2	7 56	82 56	89.0	7 55	81 55	88.9	7 54	80 55	88.7	7 53	79 54	88.6	7 51	78 54	88.5	188	352
9	171	8 57	83 56	89.1	8 56	82 55	88.9	8 55	81 54	88.7	8 53	80 53	88.6	8 52	79 53	88.4	8 50	78 52	88.3	189	351
10	170	9 57	83 54	88.9	9 55	82 54	88.8	9 54	81 53	88.6	9 53	80 52	88.4	9 51	79 51	88.2	9 49	78 50	88.1	190	350
11	169	10 56	83 53	88.8	10 55	82 52	88.6	10 53	81 51	88.5	10 52	80 50	88.3	10 50	79 49	88.1	10 48	78 48	87.9	191	349
12	168	11 56	83 52	88.7	11 55	82 51	88.5	11 53	81 49	88.3	11 51	80 48	88.1	11 49	79 47	87.9	11 47	78 46	87.7	192	348
13	167	12 56	83 51	88.6	12 54	82 49	88.4	12 52	81 48	88.2	12 50	80 46	87.9	12 48	79 45	87.7	12 45	78 43	87.5	193	347
14	166	13 55	83 49	88.5	13 54	82 47	88.3	13 52	81 46	88.0	13 49	80 44	87.8	13 47	79 42	87.5	13 44	78 40	87.3	194	346
15	165	14 55	83 47	88.4	14 53	82 45	88.1	14 51	81 43	87.9	14 49	80 41	87.6	14 46	79 39	87.3	14 43	78 37	87.1	195	345
16	164	15 55	83 46	88.3	15 53	82 43	88.0	15 50	81 41	87.7	15 48	80 39	87.4	15 45	79 36	87.1	15 42	78 34	86.9	196	344
17	163	16 54	83 44	88.2	16 52	82 41	87.9	16 50	81 38	87.6	16 47	80 36	87.3	16 44	79 33	87.0	16 41	78 31	86.7	197	343
18	162	17 54	83 42	88.1	17 52	82 39	87.7	17 49	81 36	87.4	17 46	80 33	87.1	17 43	79 30	86.8	17 39	78 27	86.5	198	342
19	161	18 54	83 39	87.9	18 51	82 36	87.6	18 48	81 33	87.3	18 45	80 29	86.9	18 42	79 26	86.6	18 38	78 23	86.2	199	341
20	160	19 53	83 37	87.8	19 51	82 33	87.5	19 48	81 30	87.1	19 45	80 26	86.7	19 41	79 22	86.4	19 37	78 19	86.0	200	340
21	159	20 53	83 35	87.7	20 50	82 30	87.3	20 47	81 26	86.9	20 44	80 22	86.6	20 40	79 18	86.2	20 36	78 14	85.8	201	339
22	158	21 52	83 32	87.6	21 50	82 27	87.2	21 46	81 23	86.8	21 43	80 18	86.4	21 39	79 14	86.0	21 35	78 10	85.6	202	338
23	157	22 52	83 29	87.5	22 49	82 24	87.0	22 46	81 19	86.6	22 42	80 14	86.2	22 38	79 09	85.8	22 33	78 05	85.4	203	337
24	156	23 52	83 26	87.3	23 49	82 21	86.9	23 45	81 15	86.5	23 41	80 10	86.0	23 37	79 05	85.6	23 32	77 59	85.1	204	336
25	155	24 51	83 23	87.2	24 48	82 17	86.7	24 44	81 11	86.3	24 40	80 05	85.8	24 36	78 59	85.4	24 31	77 54	84.9	205	335
26	154	25 51	83 20	87.1	25 48	82 13	86.6	25 44	81 07	86.1	25 39	80 00	85.6	25 35	78 54	85.2	25 29	77 48	84.7	206	334
27	153	26 50	83 16	87.0	26 47	82 09	86.4	26 43	81 02	85.9	26 38	79 55	85.4	26 33	78 48	84.9	26 28	77 42	84.4	207	333
28	152	27 50	83 13	86.8	27 46	82 05	86.3	27 42	80 57	85.8	27 38	79 50	85.2	27 32	78 42	84.7	27 27	77 35	84.2	208	332
29	151	28 50	83 09	86.7	28 46	82 01	86.1	28 41	80 52	85.6	28 37	79 44	85.0	28 31	78 36	84.5	28 25	77 28	84.0	209	331
30	150	29 49	83 05	86.5	29 45	81 56	86.0	29 41	80 47	85.4	29 36	79 38	84.8	29 30	78 29	84.3	29 24	77 21	83.7	210	330
31	149	30 49	83 01	86.4	30 45	81 51	85.8	30 40	80 41	85.2	30 35	79 32	84.6	30 29	78 23	84.0	30 22	77 13	83.5	211	329
32	148	31 48	82 56	86.3	31 44	81 46	85.6	31 39	80 35	85.0	31 34	79 25	84.4	31 27	78 15	83.8	31 21	77 05	83.2	212	328
33	147	32 48	82 51	86.1	32 43	81 40	85.5	32 38	80 29	84.8	32 33	79 18	84.2	32 26	78 08	83.6	32 19	76 57	82.9	213	327
34	146	33 47	82 46	86.0	33 43	81 35	85.3	33 37	80 23	84.6	33 32	79 11	84.0	33 25	78 00	83.3	33 18	76 48	82.7	214	326
35	145	34 47	82 41	85.8	34 42	81 29	85.1	34 37	80 16	84.4	34 30	79 03	83.7	34 24	77 51	83.1	34 16	76 39	82.4	215	325
36	144	35 46	82 36	85.7	35 41	81 22	84.9	35 36	80 09	84.2	35 29	78 55	83.5	35 22	77 42	82.8	35 14	76 29	82.1	216	324
37	143	36 46	82 30	85.5	36 41	81 16	84.8	36 35	80 01	84.0	36 28	78 47	83.3	36 21	77 33	82.5	36 13	76 19	81.8	217	323
38	142	37 45	82 24	85.3	37 40	81 09	84.6	37 34	79 53	83.8	37 27	78 38	83.0	37 19	77 23	82.3	37 11	76 09	81.5	218	322
39	141	38 45	82 18	85.2	38 39	81 01	84.4	38 33	79 45	83.6	38 26	78 29	82.8	38 18	77 13	82.0	38 09	75 57	81.2	219	321
40	140	39 44	82 11	85.0	39 39	80 54	84.2	39 32	79 36	83.3	39 25	78 19	82.5	39 16	77 02	81.7	39 07	75 46	80.9	220	320
41	139	40 44	82 04	84.8	40 38	80 46	84.0	40 31	79 27	83.1	40 23	78 09	82.3	40 15	76 51	81.4	40 05	75 33	80.6	221	319
42	138	41 43	81 57	84.6	41 37	80 37	83.7	41 30	79 17	82.9	41 22	77 58	82.0	41 13	76 39	81.1	41 04	75 21	80.3	222	318
43	137	42 42	81 49	84.4	42 36	80 28	83.5	42 29	79 07	82.6	42 21	77 47	81.7	42 12	76 27	80.8	42 02	75 07	79.9	223	317
44	136	43 42	81 41	84.2	43 35	80 19	83.3	43 28	78 57	82.3	43 19	77 35	81.4	43 10	76 14	80.5	43 00	74 53	79.6	224	316
45	135	44 41	81 33	84.0	44 34	80 09	83.1	44 27	78 46	82.1	44 18	77 22	81.1	44 08	76 00	80.1	43 57	74 38	79.2	225	315

Lat. / A		6°			7°			8°			9°			10°			11°			Lat. / A	
AHL / F		A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	AHL	
°	°	° ′	° ′	°	° ′	° ′	°	° ′	° ′	°	° ′	° ′	°	° ′	° ′	°	° ′	° ′	°	°	°
45	135	44 41	81 33	84.0	44 34	80 09	83.1	44 27	78 46	82.1	44 18	77 22	81.1	44 08	76 00	80.1	43 57	74 38	79.2	225	315
46	134	45 41	81 24	83.8	45 34	79 59	82.8	45 26	78 34	81.8	45 16	77 09	80.8	45 06	75 45	79.8	44 55	74 22	78.8	226	314
47	133	46 40	81 14	83.6	46 33	79 48	82.6	46 24	78 21	81.5	46 15	76 56	80.5	46 04	75 30	79.5	45 53	74 05	78.4	227	313
48	132	47 39	81 04	83.4	47 32	79 36	82.3	47 23	78 08	81.2	47 13	76 41	80.1	47 03	75 14	79.1	46 51	73 48	78.0	228	312
49	131	48 38	80 54	83.1	48 31	79 24	82.0	48 22	77 55	80.9	48 12	76 26	79.8	48 01	74 57	78.7	47 48	73 30	77.6	229	311
50	130	49 38	80 43	82.9	49 30	79 11	81.7	49 20	77 40	80.6	49 10	76 09	79.4	48 58	74 40	78.3	48 46	73 10	77.2	230	310
51	129	50 37	80 31	82.6	50 29	78 58	81.4	50 19	77 25	80.2	50 08	75 52	79.1	49 56	74 21	77.9	49 43	72 50	76.7	231	309
52	128	51 36	80 19	82.4	51 27	78 43	81.1	51 18	77 08	79.9	51 06	75 34	78.7	50 54	74 01	77.5	50 40	72 29	76.3	232	308
53	127	52 35	80 06	82.1	52 26	78 28	80.8	52 16	76 51	79.5	52 04	75 15	78.3	51 52	73 40	77.0	51 37	72 06	75.8	233	307
54	126	53 34	79 52	81.8	53 25	78 12	80.5	53 14	76 33	79.2	53 02	74 55	77.8	52 49	73 18	76.6	52 35	71 42	75.3	234	306
55	125	54 33	79 37	81.5	54 24	77 55	80.1	54 13	76 14	78.8	54 00	74 34	77.4	53 47	72 55	76.1	53 31	71 17	74.8	235	305
56	124	55 32	79 21	81.2	55 22	77 37	79.8	55 11	75 54	78.3	54 58	74 11	76.9	54 44	72 30	75.6	54 28	70 50	74.2	236	304
57	123	56 31	79 05	80.9	56 21	77 18	79.4	56 09	75 32	77.9	55 56	73 47	76.5	55 41	72 04	75.0	55 25	70 22	73.6	237	303
58	122	57 30	78 47	80.5	57 19	76 57	79.0	57 07	75 09	77.4	56 53	73 22	75.9	56 38	71 36	74.5	56 21	69 51	73.0	238	302
59	121	58 29	78 28	80.1	58 18	76 35	78.5	58 05	74 44	77.0	57 51	72 54	75.4	57 35	71 06	73.9	57 17	69 19	72.4	239	301
60	120	59 28	78 08	79.7	59 16	76 12	78.1	59 03	74 18	76.4	58 48	72 25	74.8	58 32	70 34	73.3	58 13	68 45	71.7	240	300
61	119	60 26	77 46	79.3	60 14	75 47	77.6	60 01	73 50	75.9	59 45	71 54	74.2	59 28	70 01	72.6	59 09	68 09	71.0	241	299
62	118	61 25	77 23	78.9	61 12	75 21	77.1	60 58	73 20	75.3	60 42	71 21	73.6	60 24	69 25	71.9	60 05	67 30	70.3	242	298
63	117	62 23	76 58	78.4	62 10	74 52	76.5	61 56	72 48	74.7	61 39	70 46	72.9	61 20	68 46	71.2	61 00	66 49	69.5	243	297
64	116	63 22	76 31	77.9	63 08	74 21	76.0	62 53	72 13	74.1	62 35	70 08	72.2	62 16	68 05	70.4	61 55	66 05	68.6	244	296
65	115	64 20	76 02	77.4	64 06	73 48	75.4	63 50	71 36	73.4	63 32	69 27	71.5	63 12	67 21	69.6	62 50	65 18	67.7	245	295
66	114	65 18	75 31	76.8	65 03	73 12	74.7	64 47	70 56	72.6	64 28	68 43	70.6	64 07	66 34	68.7	63 44	64 27	66.8	246	294
67	113	66 16	74 57	76.2	66 01	72 33	74.0	65 43	70 13	71.8	65 23	67 56	69.8	65 02	65 43	67.8	64 38	63 33	65.8	247	293
68	112	67 14	74 20	75.5	66 58	71 51	73.2	66 40	69 26	71.0	66 19	67 05	68.8	65 56	64 48	66.7	65 32	62 35	64.7	248	292
69	111	68 12	73 39	74.8	67 55	71 05	72.4	67 36	68 35	70.1	67 14	66 09	67.8	66 50	63 48	65.7	66 25	61 31	63.6	249	291
70	110	69 09	72 55	74.0	68 51	70 15	71.5	68 31	67 40	69.1	68 09	65 09	66.7	67 44	62 44	64.5	67 17	60 23	62.3	250	290
71	109	70 07	72 06	73.1	69 48	69 20	70.5	69 27	66 39	68.0	69 03	64 03	65.6	68 37	61 34	63.2	68 09	59 10	61.0	251	289
72	108	71 03	71 13	72.2	70 44	68 20	69.4	70 21	65 33	66.8	69 57	62 52	64.3	69 29	60 17	61.9	69 00	57 50	59.6	252	288
73	107	72 00	70 14	71.1	71 39	67 13	68.3	71 16	64 20	65.5	70 50	61 33	62.9	70 21	58 54	60.4	69 50	56 23	58.0	253	287
74	106	72 56	69 08	70.0	72 34	65 59	67.0	72 09	62 59	64.1	71 42	60 07	61.4	71 12	57 24	58.8	70 40	54 48	56.4	254	286
75	105	73 52	67 54	68.7	73 29	64 37	65.5	73 03	61 30	62.6	72 34	58 32	59.7	72 02	55 44	57.1	71 28	53 06	54.5	255	285
76	104	74 48	66 31	67.3	74 23	63 05	64.0	73 55	59 51	60.8	73 24	56 47	57.9	72 51	53 55	55.1	72 16	51 13	52.6	256	284
77	103	75 42	64 57	65.6	75 16	61 22	62.2	74 46	58 00	58.9	74 14	54 51	55.9	73 39	51 55	53.1	73 02	49 10	50.4	257	283
78	102	76 36	63 11	63.8	76 08	59 26	60.2	75 37	55 57	56.8	75 02	52 42	53.6	74 26	49 42	50.8	73 47	46 56	48.1	258	282
79	101	77 29	61 09	61.7	76 59	57 14	57.9	76 26	53 38	54.4	75 49	50 18	51.2	75 11	47 16	48.2	74 30	44 28	45.5	259	281
80	100	78 21	58 49	59.3	77 49	54 44	55.3	77 13	51 01	51.7	76 35	47 38	48.4	75 54	44 34	45.4	75 11	41 47	42.7	260	280
81	99	79 12	56 06	56.6	78 37	51 52	52.4	77 59	48 04	48.7	77 18	44 39	45.4	76 35	41 35	42.4	75 49	38 50	39.7	261	279
82	98	80 01	52 56	53.4	79 23	48 35	49.1	78 42	44 43	45.3	77 59	41 18	41.9	77 13	38 17	39.0	76 26	35 36	36.4	262	278
83	97	80 47	49 13	49.6	80 07	44 47	45.2	79 23	40 56	41.4	78 37	37 35	38.1	77 49	34 39	35.3	76 59	32 05	32.8	263	277
84	96	81 31	44 51	45.2	80 47	40 24	40.8	80 01	36 38	37.1	79 12	33 25	33.9	78 21	30 40	31.2	77 29	28 16	28.8	264	276
85	95	82 12	39 40	39.9	81 24	35 22	35.7	80 34	31 48	32.2	79 43	28 49	29.2	78 50	26 18	26.7	77 56	24 09	24.6	265	275
86	94	82 48	33 34	33.8	81 57	29 36	29.8	81 04	26 24	26.7	80 09	23 46	24.1	79 14	21 35	21.9	78 18	19 44	20.1	266	274
87	93	83 18	26 28	26.6	82 23	23 05	23.3	81 28	20 25	20.6	80 31	18 17	18.5	79 34	16 32	16.8	78 36	15 04	15.4	267	273
88	92	83 41	18 22	18.5	82 43	15 52	16.0	81 45	13 57	14.1	80 47	12 26	12.6	79 48	11 12	11.4	78 49	10 11	10.4	268	272
89	91	83 55	9 26	9.5	82 56	8 05	8.2	81 56	7 05	7.1	80 57	6 17	6.4	79 57	5 39	5.7	78 57	5 08	5.2	269	271
90	90	84 00	0 00	0.0	83 00	0 00	0.0	82 00	0 00	0.0	81 00	0 00	0.0	80 00	0 00	0.0	79 00	0 00	0.0	270	270

Lat. N.: para AHL > 180°... $Z_n = Z$
para AHL < 180°... $Z_n = 360° - Z$

Lat. S.: para AHL > 180°... $Z_n = 180° - Z$
para AHL < 180°... $Z_n = 180° + Z$

B : (–) para 90° < AHL < 270°
Dec : (–) para la Lat. con signo contrario

TABLA PARA REDUCCION DE VISUALES

Z_1 : mismo signo que B
Z_2 : (–) para F > 90°

Lat. / A		12°			13°			14°			15°			16°			17°			Lat. / A	
AHL / F		A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	AHL	
°	°	° ′	° ′	°	° ′	° ′	°	° ′	° ′	°	° ′	° ′	°	° ′	° ′	°	° ′	° ′	°	°	°
0	180	0 00	78 00	90.0	0 00	77 00	90.0	0 00	76 00	90.0	0 00	75 00	90.0	0 00	74 00	90.0	0 00	73 00	90.0	180	360
1	179	0 59	78 00	89.8	0 58	77 00	89.8	0 58	76 00	89.8	0 58	75 00	89.7	0 58	74 00	89.7	0 57	73 00	89.7	181	359
2	178	1 57	78 00	89.6	1 57	77 00	89.5	1 56	76 00	89.5	1 56	74 59	89.5	1 55	73 59	89.4	1 55	72 59	89.4	182	358
3	177	2 56	77 59	89.4	2 55	76 59	89.3	2 55	75 59	89.3	2 54	74 59	89.2	2 53	73 59	89.2	2 52	72 59	89.1	183	357
4	176	3 55	77 58	89.2	3 54	76 58	89.1	3 53	75 58	89.0	3 52	74 58	89.0	3 51	73 58	88.9	3 49	72 58	88.8	184	356
5	175	4 53	77 57	89.0	4 52	76 57	88.9	4 51	75 57	88.8	4 50	74 57	88.7	4 48	73 57	88.6	4 47	72 56	88.5	185	355
6	174	5 52	77 56	88.7	5 51	76 56	88.6	5 49	75 56	88.5	5 48	74 55	88.4	5 46	73 55	88.3	5 44	72 55	88.2	186	354
7	173	6 51	77 55	88.5	6 49	76 54	88.4	6 47	75 54	88.3	6 46	74 54	88.2	6 44	73 53	88.1	6 42	72 53	87.9	187	353
8	172	7 49	77 53	88.3	7 48	76 53	88.2	7 46	75 52	88.1	7 44	74 52	87.9	7 41	73 51	87.8	7 39	72 51	87.6	188	352
9	171	8 48	77 51	88.1	8 46	76 51	88.0	8 44	75 50	87.8	8 41	74 49	87.7	8 39	73 49	87.5	8 36	72 48	87.3	189	351
10	170	9 47	77 49	87.9	9 44	76 48	87.7	9 42	75 48	87.6	9 39	74 47	87.4	9 37	73 46	87.2	9 34	72 45	87.0	190	350
11	169	10 45	77 47	87.7	10 43	76 46	87.5	10 40	75 45	87.3	10 37	74 44	87.1	10 34	73 43	86.9	10 31	72 42	86.7	191	349
12	168	11 44	77 44	87.5	11 41	76 43	87.3	11 38	75 42	87.1	11 35	74 41	86.9	11 32	73 40	86.6	11 28	72 39	86.4	192	348
13	167	12 43	77 42	87.3	12 40	76 40	87.0	12 36	75 39	86.8	12 33	74 37	86.6	12 29	73 36	86.4	12 25	72 35	86.1	193	347
14	166	13 41	77 39	87.0	13 38	76 37	86.8	13 35	75 35	86.5	13 31	74 34	86.3	13 27	73 32	86.1	13 23	72 31	85.8	194	346
15	165	14 40	77 35	86.8	14 36	76 33	86.6	14 33	75 32	86.3	14 29	74 30	86.0	14 24	73 28	85.8	14 20	72 26	85.5	195	345
16	164	15 38	77 32	86.6	15 35	76 30	86.3	15 31	75 28	86.0	15 26	74 25	85.8	15 22	73 23	85.5	15 17	72 21	85.2	196	344
17	163	16 37	77 28	86.4	16 33	76 26	86.1	16 29	75 23	85.8	16 24	74 21	85.5	16 19	73 19	85.2	16 14	72 16	84.9	197	343
18	162	17 36	77 24	86.1	17 31	76 21	85.8	17 27	75 19	85.5	17 22	74 16	85.2	17 17	73 13	84.9	17 11	72 11	84.6	198	342
19	161	18 34	77 20	85.9	18 30	76 17	85.6	18 25	75 14	85.2	18 20	74 11	84.9	18 14	73 08	84.6	18 08	72 05	84.3	199	341
20	160	19 33	77 15	85.7	19 28	76 12	85.3	19 23	75 08	85.0	19 17	74 05	84.6	19 12	73 02	84.3	19 05	71 59	83.9	200	340
21	159	20 31	77 10	85.4	20 26	76 07	85.1	20 21	75 03	84.7	20 15	73 59	84.3	20 09	72 56	84.0	20 03	71 52	83.6	201	339
22	158	21 30	77 05	85.2	21 24	76 01	84.8	21 19	74 57	84.4	21 13	73 53	84.0	21 06	72 49	83.6	21 00	71 45	83.3	202	338
23	157	22 28	77 00	85.0	22 23	75 55	84.5	22 17	74 51	84.1	22 10	73 46	83.7	22 04	72 42	83.3	21 56	71 38	82.9	203	337
24	156	23 27	76 54	84.7	23 21	75 49	84.3	23 15	74 44	83.9	23 08	73 39	83.4	23 01	72 34	83.0	22 53	71 30	82.6	204	336
25	155	24 25	76 48	84.5	24 19	75 43	84.0	24 13	74 37	83.6	24 06	73 32	83.1	23 58	72 27	82.7	23 50	71 22	82.2	205	335
26	154	25 23	76 42	84.2	25 17	75 36	83.7	25 10	74 30	83.3	25 03	73 24	82.8	24 55	72 18	82.3	24 47	71 13	81.9	206	334
27	153	26 22	76 35	84.0	26 15	75 28	83.5	26 08	74 22	83.0	26 01	73 16	82.5	25 52	72 10	82.0	25 44	71 04	81.5	207	333
28	152	27 20	76 28	83.7	27 13	75 21	83.2	27 06	74 14	82.7	26 58	73 07	82.2	26 50	72 00	81.7	26 41	70 54	81.2	208	332
29	151	28 18	76 20	83.4	28 11	75 13	82.9	28 04	74 05	82.4	27 55	72 58	81.8	27 47	71 51	81.3	27 37	70 44	80.8	209	331
30	150	29 17	76 13	83.2	29 09	75 04	82.6	29 01	73 56	82.0	28 53	72 48	81.5	28 44	71 41	81.0	28 34	70 33	80.4	210	330
31	149	30 15	76 04	82.9	30 07	74 56	82.3	29 59	73 47	81.7	29 50	72 38	81.2	29 41	71 30	80.6	29 30	70 22	80.0	211	329
32	148	31 13	75 56	82.6	31 05	74 46	82.0	30 57	73 37	81.4	30 47	72 28	80.8	30 37	71 19	80.2	30 27	70 11	79.6	212	328
33	147	32 11	75 47	82.3	32 03	74 37	81.7	31 54	73 27	81.1	31 44	72 17	80.5	31 34	71 07	79.9	31 23	69 58	79.2	213	327
34	146	33 10	75 37	82.0	33 01	74 26	81.4	32 52	73 16	80.7	32 42	72 05	80.1	32 31	70 55	79.5	32 20	69 45	78.8	214	326
35	145	34 08	75 27	81.7	33 59	74 16	81.0	33 49	73 04	80.4	33 39	71 53	79.7	33 28	70 42	79.1	33 16	69 32	78.4	215	325
36	144	35 06	75 17	81.4	34 56	74 04	80.7	34 46	72 52	80.0	34 36	71 40	79.4	34 24	70 29	78.7	34 12	69 18	78.0	216	324
37	143	36 04	75 06	81.1	35 54	73 53	80.4	35 44	72 40	79.7	35 33	71 27	79.0	35 21	70 15	78.3	35 08	69 03	77.6	217	323
38	142	37 02	74 54	80.8	36 52	73 40	80.0	36 41	72 27	79.3	36 29	71 13	78.6	36 17	70 00	77.8	36 04	68 48	77.1	218	322
39	141	38 00	74 42	80.4	37 49	73 27	79.7	37 38	72 13	78.9	37 26	70 59	78.2	37 13	69 45	77.4	37 00	68 32	76.7	219	321
40	140	38 57	74 30	80.1	38 47	73 14	79.3	38 35	71 58	78.5	38 23	70 43	77.7	38 10	69 29	77.0	37 56	68 15	76.2	220	320
41	139	39 55	74 16	79.8	39 44	72 59	78.9	39 32	71 43	78.1	39 19	70 27	77.3	39 06	69 12	76.5	38 51	67 57	75.7	221	319
42	138	40 53	74 02	79.4	40 41	72 45	78.5	40 29	71 27	77.7	40 16	70 10	76.9	40 02	68 54	76.1	39 47	67 38	75.3	222	318
43	137	41 51	73 48	79.0	41 39	72 29	78.2	41 26	71 11	77.3	41 12	69 53	76.4	40 58	68 35	75.6	40 42	67 19	74.7	223	317
44	136	42 48	73 32	78.6	42 36	72 12	77.7	42 23	70 53	76.9	42 09	69 34	76.0	41 54	68 16	75.1	41 38	66 58	74.2	224	316
45	135	43 46	73 16	78.3	43 33	71 55	77.3	43 19	70 35	76.4	43 05	69 15	75.5	42 49	67 56	74.6	42 33	66 37	73.7	225	315

Lat. / A		12°			13°			14°			15°			16°			17°			Lat. / A	
AHL / F		A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	AHL	
°	°	° ′	° ′	°	° ′	° ′	°	° ′	° ′	°	° ′	° ′	°	° ′	° ′	°	° ′	° ′	°	°	°
45	135	43 46	73 16	78.3	43 33	71 55	77.3	43 19	70 35	76.4	43 05	69 15	75.5	42 49	67 56	74.6	42 33	66 37	73.7	225	315
46	134	44 43	72 59	77.8	44 30	71 37	76.9	44 16	70 15	75.9	44 01	68 54	75.0	43 45	67 34	74.1	43 28	66 15	73.2	226	314
47	133	45 40	72 41	77.4	45 27	71 18	76.4	45 12	69 55	75.5	44 57	68 33	74.5	44 40	67 12	73.5	44 23	65 51	72.6	227	313
48	132	46 38	72 23	77.0	46 24	70 58	76.0	46 09	69 34	75.0	45 53	68 11	74.0	45 35	66 48	73.0	45 17	65 27	72.0	228	312
49	131	47 35	72 03	76.5	47 20	70 37	75.5	47 05	69 11	74.4	46 48	67 47	73.4	46 30	66 23	72.4	46 12	65 01	71.4	229	311
50	130	48 32	71 42	76.1	48 17	70 15	75.0	48 01	68 48	73.9	47 44	67 22	72.9	47 25	65 58	71.8	47 06	64 34	70.8	230	310
51	129	49 29	71 20	75.6	49 13	69 51	74.5	48 57	68 23	73.4	48 39	66 56	72.3	48 20	65 30	71.2	48 00	64 05	70.1	231	309
52	128	50 25	70 57	75.1	50 09	69 27	73.9	49 52	67 57	72.8	49 34	66 29	71.7	49 15	65 02	70.6	48 54	63 35	69.5	232	308
53	127	51 22	70 33	74.6	51 06	69 01	73.4	50 48	67 30	72.2	50 29	66 00	71.0	50 09	64 31	69.9	49 48	63 04	68.8	233	307
54	126	52 19	70 07	74.0	52 02	68 33	72.8	51 43	67 01	71.6	51 24	65 30	70.4	51 03	64 00	69.2	50 41	62 31	68.1	234	306
55	125	53 15	69 40	73.5	52 57	68 04	72.2	52 38	66 30	70.9	52 18	64 58	69.7	51 57	63 26	68.5	51 34	61 56	67.3	235	305
56	124	54 11	69 11	72.9	53 53	67 34	71.6	53 33	65 58	70.3	53 12	64 24	69.0	52 50	62 51	67.8	52 27	61 20	66.6	236	304
57	123	55 07	68 41	72.2	54 48	67 02	70.9	54 28	65 24	69.6	54 06	63 48	68.3	53 43	62 14	67.0	53 19	60 42	65.8	237	303
58	122	56 03	68 09	71.6	55 43	66 28	70.2	55 22	64 48	68.8	55 00	63 11	67.5	54 36	61 35	66.2	54 12	60 01	64.9	238	302
59	121	56 59	67 34	70.9	56 38	65 51	69.5	56 16	64 10	68.1	55 53	62 31	66.7	55 29	60 54	65.4	55 03	59 18	64.1	239	301
60	120	57 54	66 58	70.2	57 33	65 13	68.7	57 10	63 30	67.3	56 46	61 49	65.9	56 21	60 10	64.5	55 55	58 33	63.1	240	300
61	119	58 49	66 20	69.4	58 27	64 32	67.9	58 04	62 47	66.4	57 39	61 04	65.0	57 13	59 24	63.6	56 46	57 46	62.2	241	299
62	118	59 44	65 38	68.6	59 21	63 49	67.1	58 57	62 02	65.5	58 31	60 17	64.0	58 05	58 35	62.6	57 36	56 56	61.2	242	298
63	117	60 38	64 55	67.8	60 15	63 03	66.2	59 50	61 13	64.6	59 23	59 27	63.1	58 55	57 43	61.6	58 26	56 03	60.2	243	297
64	116	61 32	64 08	66.9	61 08	62 14	65.2	60 42	60 22	63.6	60 15	58 34	62.0	59 46	56 49	60.5	59 16	55 06	59.1	244	296
65	115	62 26	63 18	66.0	62 01	61 21	64.2	61 34	59 28	62.6	61 06	57 37	61.0	60 36	55 51	59.4	60 05	54 07	57.9	245	295
66	114	63 20	62 25	65.0	62 53	60 25	63.2	62 26	58 30	61.5	61 56	56 37	59.8	61 25	54 49	58.2	60 53	53 04	56.7	246	294
67	113	64 13	61 27	63.9	63 45	59 25	62.1	63 16	57 27	60.3	62 46	55 34	58.6	62 14	53 44	57.0	61 41	51 57	55.4	247	293
68	112	65 05	60 26	62.8	64 37	58 21	60.9	64 07	56 21	59.1	63 35	54 25	57.4	63 02	52 34	55.7	62 27	50 47	54.1	248	292
69	111	65 57	59 20	61.6	65 27	57 13	59.6	64 56	55 10	57.8	64 23	53 13	56.0	63 49	51 20	54.3	63 14	49 32	52.7	249	291
70	110	66 48	58 08	60.3	66 18	55 59	58.3	65 45	53 55	56.4	65 11	51 55	54.6	64 36	50 01	52.9	63 59	48 12	51.2	250	290
71	109	67 39	56 52	58.9	67 07	54 40	56.8	66 33	52 33	54.9	65 58	50 33	53.1	65 21	48 38	51.3	64 43	46 48	49.7	251	289
72	108	68 29	55 29	57.4	67 55	53 14	55.3	67 20	51 06	53.3	66 44	49 04	51.5	66 06	47 08	49.7	65 26	45 18	48.0	252	288
73	107	69 18	53 59	55.8	68 43	51 42	53.7	68 07	49 33	51.6	67 29	47 30	49.8	66 49	45 33	48.0	66 08	43 43	46.3	253	287
74	106	70 06	52 22	54.1	69 30	50 03	51.9	68 52	47 52	49.8	68 12	45 49	47.9	67 31	43 52	46.1	66 49	42 02	44.4	254	286
75	105	70 53	50 36	52.2	70 15	48 16	50.0	69 36	46 04	47.9	68 55	44 00	46.0	68 12	42 04	44.2	67 29	40 15	42.5	255	285
76	104	71 38	48 42	50.2	70 59	46 20	47.9	70 18	44 08	45.9	69 36	42 05	43.9	68 52	40 09	42.1	68 07	38 21	40.5	256	284
77	103	72 23	46 37	48.0	71 42	44 15	45.7	70 59	42 03	43.7	70 15	40 01	41.7	69 30	38 07	39.9	68 43	36 21	38.3	257	283
78	102	73 06	44 22	45.6	72 23	42 00	43.4	71 38	39 49	41.3	70 53	37 49	39.4	70 06	35 57	37.6	69 18	34 13	36.0	258	282
79	101	73 47	41 55	43.1	73 02	39 34	40.8	72 16	37 26	38.8	71 28	35 27	36.9	70 40	33 38	35.2	69 50	31 58	33.6	259	281
80	100	74 26	39 15	40.3	73 39	36 57	38.1	72 51	34 51	36.1	72 02	32 57	34.3	71 12	31 12	32.6	70 21	29 36	31.1	260	280
81	99	75 02	36 21	37.3	74 14	34 07	35.1	73 24	32 06	33.2	72 34	30 17	31.5	71 42	28 37	29.9	70 50	27 06	28.4	261	279
82	98	75 37	33 13	34.1	74 46	31 05	32.0	73 55	29 10	30.2	73 03	27 27	28.5	72 09	25 53	27.0	71 16	24 29	25.7	262	278
83	97	76 08	29 50	30.6	75 16	27 50	28.6	74 23	26 03	26.9	73 29	24 27	25.4	72 34	23 02	24.0	71 39	21 44	22.8	263	277
84	96	76 36	26 11	26.8	75 42	24 22	25.0	74 48	22 45	23.5	73 52	21 19	22.1	72 56	20 02	20.9	72 00	18 53	19.8	264	276
85	95	77 01	22 18	22.8	76 05	20 41	21.3	75 09	19 16	19.9	74 12	18 01	18.7	73 15	16 54	17.6	72 18	15 55	16.7	265	275
86	94	77 22	18 10	18.6	76 25	16 49	17.3	75 27	15 38	16.1	74 29	14 36	15.1	73 31	13 40	14.2	72 33	12 51	13.5	266	274
87	93	77 38	13 50	14.1	76 40	12 46	13.1	75 41	11 51	12.2	74 43	11 03	11.4	73 44	10 21	10.8	72 45	9 43	10.2	267	273
88	92	77 50	9 19	9.5	76 51	8 36	8.8	75 52	7 58	8.2	74 52	7 25	7.7	73 53	6 56	7.2	72 53	6 31	6.8	268	272
89	91	77 58	4 42	4.8	76 58	4 19	4.4	75 58	4 00	4.1	74 58	3 44	3.9	73 58	3 29	3.6	72 58	3 16	3.4	269	271
90	90	78 00	0 00	0.0	77 00	0 00	0.0	76 00	0 00	0.0	75 00	0 00	0.0	74 00	0 00	0.0	73 00	0 00	0.0	270	270

Lat. N.: para AHL > 180°... $Z_n = Z$
para AHL < 180°... $Z_n = 360° - Z$

Lat. S.: para AHL > 180°... $Z_n = 180° - Z$
para AHL < 180°... $Z_n = 180° + Z$

B : (–) para 90° < AHL < 270°
Dec : (–) para la Lat. con signo contrario

TABLA PARA REDUCCION DE VISUALES

Z_1 : mismo signo que B
Z_2 : (–) para F > 90°

Lat. / A		18°			19°			20°			21°			22°			23°			Lat. / A	
AHL	F	A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	AHL	
°	°	° ′	° ′	°	° ′	° ′	°	° ′	° ′	°	° ′	° ′	°	° ′	° ′	°	° ′	° ′	°	°	°
0	180	0 00	72 00	90.0	0 00	71 00	90.0	0 00	70 00	90.0	0 00	69 00	90.0	0 00	68 00	90.0	0 00	67 00	90.0	180	360
1	179	0 57	72 00	89.7	0 57	71 00	89.7	0 56	70 00	89.7	0 56	69 00	89.6	0 56	68 00	89.6	0 55	67 00	89.6	181	359
2	178	1 54	71 59	89.4	1 53	70 59	89.3	1 53	69 59	89.3	1 52	68 59	89.3	1 51	67 59	89.3	1 50	66 59	89.2	182	358
3	177	2 51	71 59	89.1	2 50	70 59	89.0	2 49	69 58	89.0	2 48	68 58	88.9	2 47	67 58	88.9	2 46	66 58	88.8	183	357
4	176	3 48	71 58	88.8	3 47	70 57	88.7	3 46	69 57	88.6	3 44	68 57	88.6	3 42	67 57	88.5	3 41	66 57	88.4	184	356
5	175	4 45	71 56	88.5	4 44	70 56	88.4	4 42	69 56	88.3	4 40	68 56	88.2	4 38	67 55	88.1	4 36	66 55	88.0	185	355
6	174	5 42	71 54	88.1	5 40	70 54	88.0	5 38	69 54	87.9	5 36	68 54	87.8	5 34	67 53	87.7	5 31	66 53	87.6	186	354
7	173	6 39	71 52	87.8	6 37	70 52	87.7	6 35	69 52	87.6	6 32	68 51	87.5	6 29	67 51	87.4	6 26	66 51	87.3	187	353
8	172	7 36	71 50	87.5	7 34	70 50	87.4	7 31	69 49	87.2	7 28	68 49	87.1	7 25	67 48	87.0	7 22	66 48	86.9	188	352
9	171	8 33	71 47	87.2	8 30	70 47	87.0	8 27	69 46	86.9	8 24	68 46	86.8	8 20	67 45	86.6	8 17	66 45	86.5	189	351
10	170	9 30	71 44	86.9	9 27	70 44	86.7	9 23	69 43	86.5	9 20	68 42	86.4	9 16	67 42	86.2	9 12	66 41	86.1	190	350
11	169	10 27	71 41	86.6	10 24	70 40	86.4	10 20	69 39	86.2	10 16	68 39	86.0	10 11	67 38	85.8	10 07	66 37	85.7	191	349
12	168	11 24	71 37	86.2	11 20	70 36	86.0	11 16	69 35	85.8	11 12	68 34	85.6	11 07	67 33	85.4	11 02	66 32	85.3	192	348
13	167	12 21	71 33	85.9	12 17	70 32	85.7	12 12	69 31	85.5	12 07	68 30	85.3	12 02	67 29	85.1	11 57	66 28	84.8	193	347
14	166	13 18	71 29	85.6	13 13	70 28	85.4	13 08	69 26	85.1	13 03	68 25	84.9	12 58	67 24	84.7	12 52	66 22	84.4	194	346
15	165	14 15	71 24	85.3	14 10	70 23	85.0	14 05	69 21	84.8	13 59	68 20	84.5	13 53	67 18	84.3	13 47	66 17	84.0	195	345
16	164	15 12	71 19	84.9	15 06	70 18	84.7	15 01	69 16	84.4	14 55	68 14	84.1	14 48	67 12	83.9	14 42	66 10	83.6	196	344
17	163	16 09	71 14	84.6	16 03	70 12	84.3	15 57	69 10	84.0	15 50	68 08	83.7	15 44	67 06	83.5	15 37	66 04	83.2	197	343
18	162	17 05	71 08	84.3	16 59	70 06	84.0	16 53	69 03	83.7	16 46	68 01	83.4	16 39	66 59	83.1	16 32	65 57	82.8	198	342
19	161	18 02	71 02	83.9	17 56	69 59	83.6	17 49	68 57	83.3	17 42	67 54	83.0	17 34	66 52	82.7	17 26	65 49	82.3	199	341
20	160	18 59	70 56	83.6	18 52	69 53	83.2	18 45	68 50	82.9	18 37	67 47	82.6	18 29	66 44	82.2	18 21	65 41	81.9	200	340
21	159	19 56	70 49	83.2	19 48	69 45	82.9	19 41	68 42	82.5	19 33	67 39	82.2	19 24	66 36	81.8	19 16	65 33	81.5	201	339
22	158	20 52	70 41	82.9	20 45	69 38	82.5	20 37	68 34	82.1	20 28	67 31	81.8	20 19	66 27	81.4	20 10	65 24	81.0	202	338
23	157	21 49	70 33	82.5	21 41	69 29	82.1	21 32	68 26	81.7	21 24	67 22	81.4	21 14	66 18	81.0	21 05	65 15	80.6	203	337
24	156	22 45	70 25	82.2	22 37	69 21	81.8	22 28	68 17	81.3	22 19	67 12	80.9	22 09	66 09	80.5	21 59	65 05	80.1	204	336
25	155	23 42	70 17	81.8	23 33	69 12	81.4	23 24	68 07	80.9	23 14	67 03	80.5	23 04	65 58	80.1	22 54	64 54	79.7	205	335
26	154	24 38	70 07	81.4	24 29	69 02	81.0	24 20	67 57	80.5	24 09	66 52	80.1	23 59	65 48	79.6	23 48	64 43	79.2	206	334
27	153	25 35	69 58	81.1	25 25	68 52	80.6	25 15	67 47	80.1	25 05	66 42	79.7	24 54	65 36	79.2	24 42	64 32	78.7	207	333
28	152	26 31	69 48	80.7	26 21	68 42	80.2	26 11	67 36	79.7	26 00	66 30	79.2	25 48	65 25	78.7	25 36	64 19	78.3	208	332
29	151	27 27	69 37	80.3	27 17	68 31	79.8	27 06	67 24	79.3	26 55	66 18	78.8	26 43	65 12	78.3	26 30	64 07	77.8	209	331
30	150	28 24	69 26	79.9	28 13	68 19	79.4	28 01	67 12	78.8	27 50	66 06	78.3	27 37	64 59	77.8	27 24	63 53	77.3	210	330
31	149	29 20	69 14	79.5	29 09	68 07	78.9	28 57	67 00	78.4	28 44	65 53	77.8	28 31	64 46	77.3	28 18	63 39	76.8	211	329
32	148	30 16	69 02	79.1	30 04	67 54	78.5	29 52	66 46	77.9	29 39	65 39	77.4	29 26	64 32	76.8	29 12	63 25	76.3	212	328
33	147	31 12	68 49	78.7	31 00	67 41	78.1	30 47	66 32	77.5	30 34	65 24	76.9	30 20	64 17	76.3	30 05	63 09	75.8	213	327
34	146	32 08	68 36	78.2	31 55	67 27	77.6	31 42	66 18	77.0	31 28	65 09	76.4	31 14	64 01	75.8	30 59	62 53	75.2	214	326
35	145	33 04	68 22	77.8	32 51	67 12	77.2	32 37	66 03	76.5	32 23	64 54	75.9	32 08	63 45	75.3	31 52	62 36	74.7	215	325
36	144	33 59	68 07	77.3	33 46	66 57	76.7	33 32	65 47	76.0	33 17	64 37	75.4	33 01	63 28	74.8	32 45	62 19	74.2	216	324
37	143	34 55	67 52	76.9	34 41	66 41	76.2	34 26	65 30	75.5	34 11	64 20	74.9	33 55	63 10	74.2	33 38	62 01	73.6	217	323
38	142	35 50	67 36	76.4	35 36	66 24	75.7	35 21	65 13	75.0	35 05	64 02	74.4	34 48	62 51	73.7	34 31	61 41	73.0	218	322
39	141	36 46	67 19	76.0	36 31	66 06	75.2	36 15	64 54	74.5	35 59	63 43	73.8	35 42	62 32	73.1	35 24	61 21	72.4	219	321
40	140	37 41	67 01	75.5	37 26	65 48	74.7	37 10	64 35	74.0	36 53	63 23	73.3	36 35	62 12	72.6	36 17	61 01	71.8	220	320
41	139	38 36	66 42	75.0	38 20	65 29	74.2	38 04	64 15	73.4	37 46	63 02	72.7	37 28	61 50	72.0	37 09	60 39	71.2	221	319
42	138	39 31	66 23	74.5	39 15	65 08	73.7	38 58	63 54	72.9	38 40	62 41	72.1	38 21	61 28	71.4	38 01	60 16	70.6	222	318
43	137	40 26	66 03	73.9	40 09	64 47	73.1	39 51	63 33	72.3	39 33	62 18	71.5	39 13	61 05	70.7	38 53	59 52	70.0	223	317
44	136	41 21	65 42	73.4	41 03	64 25	72.5	40 45	63 10	71.7	40 26	61 55	70.9	40 06	60 41	70.1	39 45	59 27	69.3	224	316
45	135	42 16	65 19	72.8	41 57	64 02	72.0	41 38	62 46	71.1	41 19	61 30	70.3	40 58	60 15	69.5	40 37	59 01	68.7	225	315

Lat. / A		18°			19°			20°			21°			22°			23°			Lat. / A	
AHL / F		A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	AHL	
°	°	° ′	° ′	°	° ′	° ′	°	° ′	° ′	°	° ′	° ′	°	° ′	° ′	°	° ′	° ′	°	°	°
45	135	42 16	65 19	72.8	41 57	64 02	72.0	41 38	62 46	71.1	41 19	61 30	70.3	40 58	60 15	69.5	40 37	59 01	68.7	225	315
46	134	43 10	64 56	72.3	42 51	63 38	71.4	42 32	62 21	70.5	42 11	61 05	69.6	41 50	59 49	68.8	41 28	58 34	68.0	226	314
47	133	44 04	64 32	71.7	43 45	63 13	70.8	43 25	61 55	69.9	43 04	60 38	69.0	42 42	59 21	68.1	42 19	58 06	67.3	227	313
48	132	44 58	64 06	71.1	44 38	62 46	70.1	44 18	61 27	69.2	43 56	60 09	68.3	43 33	58 53	67.4	43 10	57 37	66.5	228	312
49	131	45 52	63 39	70.4	45 32	62 18	69.5	45 10	60 59	68.5	44 48	59 40	67.6	44 24	58 22	66.7	44 00	57 06	65.8	229	311
50	130	46 46	63 11	69.8	46 25	61 49	68.8	46 03	60 29	67.8	45 39	59 09	66.9	45 15	57 51	65.9	44 50	56 34	65.0	230	310
51	129	47 39	62 42	69.1	47 17	61 19	68.1	46 55	59 57	67.1	46 31	58 37	66.1	46 06	57 18	65.2	45 40	56 00	64.2	231	309
52	128	48 33	62 11	68.4	48 10	60 47	67.4	47 46	59 25	66.4	47 22	58 03	65.4	46 56	56 44	64.4	46 30	55 25	63.4	232	308
53	127	49 25	61 38	67.7	49 02	60 13	66.6	43 38	58 50	65.6	48 13	57 28	64.6	47 46	56 07	63.6	47 19	54 48	62.6	233	307
54	126	50 18	61 04	67.0	49 54	59 38	65.9	49 29	58 14	64.8	49 03	56 51	63.7	48 36	55 30	62.7	48 08	54 10	61.7	234	306
55	125	51 10	60 28	66.2	50 46	59 01	65.1	50 20	57 36	64.0	49 53	56 12	62.9	49 25	54 50	61.9	48 56	53 30	60.8	235	305
56	124	52 03	59 50	65.4	51 37	58 23	64.2	51 10	56 56	63.1	50 43	55 32	62.0	50 14	54 09	61.0	49 44	52 48	59.9	236	304
57	123	52 54	59 11	64.6	52 28	57 42	63.4	52 00	56 15	62.2	51 32	54 49	61.1	51 02	53 26	60.0	50 32	52 04	59.0	237	303
58	122	53 46	58 29	63.7	53 18	56 59	62.5	52 50	55 31	61.3	52 21	54 05	60.2	51 50	52 41	59.1	51 19	51 18	58.0	238	302
59	121	54 37	57 45	62.8	54 08	56 14	61.5	53 39	54 45	60.4	53 09	53 18	59.2	52 38	51 53	58.1	52 06	50 30	57.0	239	301
60	120	55 27	56 59	61.8	54 58	55 27	60.6	54 28	53 57	59.4	53 57	52 29	58.2	53 25	51 04	57.0	52 52	49 40	55.9	240	300
61	119	56 17	56 10	60.9	55 47	54 37	59.6	55 16	53 06	58.3	54 44	51 38	57.1	54 11	50 12	55.9	53 37	48 48	54.8	241	299
62	118	57 07	55 19	59.8	56 36	53 45	58.5	56 04	52 13	57.2	55 31	50 44	56.0	54 57	49 17	54.8	54 22	47 53	53.7	242	298
63	117	57 56	54 25	58.8	57 24	52 49	57.4	56 51	51 17	56.1	56 17	49 47	54.9	55 42	48 20	53.7	55 06	46 55	52.5	243	297
64	116	58 44	53 27	57.6	58 12	51 51	56.3	57 38	50 18	55.0	57 03	48 48	53.7	56 27	47 20	52.5	55 50	45 55	51.3	244	296
65	115	59 32	52 27	56.5	58 58	50 50	55.1	58 23	49 16	53.7	57 47	47 45	52.5	57 10	46 17	51.2	56 32	44 52	50.0	245	295
66	114	60 19	51 23	55.2	59 45	49 45	53.8	59 09	48 11	52.5	58 32	46 39	51.2	57 53	45 11	49.9	57 14	43 47	48.7	246	294
67	113	61 06	50 15	53.9	60 30	48 37	52.5	59 53	47 02	51.1	59 15	45 30	49.8	58 36	44 02	48.6	57 55	42 38	47.4	247	293
68	112	61 52	49 04	52.6	61 15	47 25	51.1	60 36	45 50	49.8	59 57	44 18	48.4	59 17	42 50	47.2	58 36	41 26	46.0	248	292
69	111	62 37	47 48	51.2	61 58	46 09	49.7	61 19	44 33	48.3	60 39	43 02	47.0	59 57	41 34	45.7	59 15	40 10	44.5	249	291
70	110	63 21	46 28	49.7	62 41	44 48	48.2	62 01	43 13	46.8	61 19	41 42	45.4	60 36	40 15	44.2	59 53	38 52	43.0	250	290
71	109	64 04	45 03	48.1	63 23	43 24	46.6	62 41	41 49	45.2	61 58	40 18	43.9	61 15	38 52	42.6	60 30	37 29	41.4	251	289
72	108	64 45	43 34	46.4	64 04	41 54	44.9	63 21	40 20	43.5	62 37	38 50	42.2	61 52	37 25	40.9	61 06	36 03	39.7	252	288
73	107	65 26	41 59	44.7	64 43	40 20	43.2	63 59	38 46	41.8	63 14	37 18	40.5	62 27	35 53	39.2	61 41	34 34	38.0	253	287
74	106	66 06	40 19	42.9	65 21	38 41	41.4	64 36	37 08	40.0	63 49	35 41	38.7	63 02	34 18	37.4	62 14	33 00	36.3	254	286
75	105	66 44	38 32	40.9	65 58	36 56	39.5	65 11	35 25	38.1	64 23	33 59	36.8	63 35	32 39	35.6	62 46	31 22	34.4	255	285
76	104	67 20	36 40	38.9	66 33	35 05	37.4	65 45	33 37	36.1	64 56	32 13	34.8	64 07	30 55	33.6	63 16	29 41	32.5	256	284
77	103	67 55	34 42	36.8	67 07	33 09	35.3	66 18	31 43	34.0	65 27	30 22	32.8	64 37	29 06	31.6	63 45	27 55	30.6	257	283
78	102	68 29	32 37	34.5	67 39	31 07	33.1	66 48	29 44	31.9	65 57	28 26	30.7	65 05	27 14	29.6	64 13	26 06	28.5	258	282
79	101	69 00	30 25	32.2	68 09	29 00	30.8	67 17	27 40	29.6	66 25	26 26	28.5	65 32	25 17	27.4	64 38	24 12	26.4	259	281
80	100	69 29	28 07	29.7	68 37	26 46	28.4	67 44	25 30	27.3	66 50	24 20	26.2	65 56	23 15	25.2	65 02	22 15	24.3	260	280
81	99	69 57	25 43	27.1	69 03	24 26	25.9	68 09	23 15	24.8	67 14	22 10	23.8	66 19	21 10	22.9	65 23	20 14	22.1	261	279
82	98	70 21	23 11	24.5	69 27	22 00	23.3	68 31	20 56	22.3	67 36	19 56	21.4	66 40	19 00	20.6	65 43	18 09	19.8	262	278
83	97	70 44	20 34	21.7	69 48	19 29	20.7	68 51	18 31	19.7	67 55	17 37	18.9	66 58	16 47	18.1	66 01	16 01	17.4	263	277
84	96	71 03	17 50	18.8	70 07	16 53	17.9	69 09	16 01	17.1	68 12	15 14	16.3	67 14	14 30	15.7	66 16	13 50	15.1	264	276
85	95	71 20	15 01	15.8	70 23	14 12	15.0	69 25	13 28	14.3	68 26	12 48	13.7	67 28	12 10	13.1	66 29	11 36	12.6	265	275
86	94	71 35	12 07	12.8	70 36	11 27	12.1	69 37	10 51	11.6	68 38	10 18	11.0	67 39	9 48	10.6	66 40	9 20	10.1	266	274
87	93	71 46	9 09	9.6	70 46	8 39	9.1	69 47	8 11	8.7	68 48	7 46	8.3	67 48	7 23	8.0	66 49	7 02	7.6	267	273
88	92	71 54	6 08	6.4	70 54	5 47	6.1	69 54	5 29	5.8	68 55	5 12	5.6	67 55	4 56	5.3	66 55	4 42	5.1	268	272
89	91	71 58	3 04	3.2	70 58	2 54	3.1	69 59	2 45	2.9	68 59	2 36	2.8	67 59	2 28	2.7	66 59	2 21	2.6	269	271
90	90	72 00	0 00	0.0	71 00	0 00	0.0	70 00	0 00	0.0	69 00	0 00	0.0	68 00	0 00	0.0	67 00	0 00	0.0	270	270

Lat. N.: para AHL > 180°... $Z_n = Z$
para AHL < 180°... $Z_n = 360° - Z$

Lat. S.: para AHL > 180°... $Z_n = 180° - Z$
para AHL < 180°... $Z_n = 180° + Z$

B : (–) para 90° < AHL < 270°
Dec : (–) para la Lat. con signo contrario

TABLA PARA REDUCCION DE VISUALES

Z_1 : mismo signo que B
Z_2 : (–) para F > 90°

Lat. / A		24°			25°			26°			27°			28°			29°			Lat. / A	
AHL / F		A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	AHL	
°	°	° ′	° ′	°	° ′	° ′	°	° ′	° ′	°	° ′	° ′	°	° ′	° ′	°	° ′	° ′	°	°	°
0	180	0 00	66 00	90.0	0 00	65 00	90.0	0 00	64 00	90.0	0 00	63 00	90.0	0 00	62 00	90.0	0 00	61 00	90.0	180	360
1	179	0 55	66 00	89.6	0 54	65 00	89.6	0 54	64 00	89.6	0 53	63 00	89.5	0 53	62 00	89.5	0 52	61 00	89.5	181	359
2	178	1 50	65 59	89.2	1 49	64 59	89.2	1 48	63 59	89.1	1 47	62 59	89.1	1 46	61 59	89.1	1 45	60 59	89.0	182	358
3	177	2 44	65 58	88.8	2 43	64 58	88.7	2 42	63 58	88.7	2 40	62 58	88.6	2 39	61 58	88.6	2 37	60 58	88.5	183	357
4	176	3 39	65 57	88.4	3 37	64 57	88.3	3 36	63 57	88.2	3 34	62 57	88.2	3 32	61 57	88.1	3 30	60 56	88.1	184	356
5	175	4 34	65 55	88.0	4 32	64 55	87.9	4 30	63 55	87.8	4 27	62 55	87.7	4 25	61 55	87.6	4 22	60 54	87.6	185	355
6	174	5 29	65 53	87.6	5 26	64 53	87.5	5 23	63 53	87.4	5 21	62 52	87.3	5 18	61 52	87.2	5 15	60 52	87.1	186	354
7	173	6 24	65 50	87.1	6 20	64 50	87.0	6 17	63 50	86.9	6 14	62 50	86.8	6 11	61 49	86.7	6 07	60 49	86.6	187	353
8	172	7 18	65 47	86.7	7 15	64 47	86.6	7 11	63 47	86.5	7 07	62 46	86.3	7 04	61 46	86.2	6 59	60 46	86.1	188	352
9	171	8 13	65 44	86.3	8 09	64 44	86.2	8 05	63 43	86.0	8 01	62 43	85.9	7 56	61 42	85.7	7 52	60 42	85.6	189	351
10	170	9 08	65 40	85.9	9 03	64 40	85.7	8 59	63 39	85.6	8 54	62 39	85.4	8 49	61 38	85.3	8 44	60 38	85.1	190	350
11	169	10 02	65 36	85.5	9 57	64 35	85.3	9 52	63 35	85.1	9 47	62 34	85.0	9 42	61 33	84.8	9 36	60 33	84.6	191	349
12	168	10 57	65 32	85.1	10 52	64 31	84.9	10 46	63 30	84.7	10 41	62 29	84.5	10 35	61 28	84.3	10 29	60 28	84.1	192	348
13	167	11 52	65 27	84.6	11 46	64 26	84.4	11 40	63 25	84.2	11 34	62 24	84.0	11 27	61 23	83.8	11 21	60 22	83.6	193	347
14	166	12 46	65 21	84.2	12 40	64 20	84.0	12 34	63 19	83.8	12 27	62 18	83.5	12 20	61 17	83.3	12 13	60 16	83.1	194	346
15	165	13 41	65 15	83.8	13 34	64 14	83.5	13 27	63 13	83.3	13 20	62 11	83.1	13 13	61 10	82.8	13 05	60 09	82.6	195	345
16	164	14 35	65 09	83.3	14 28	64 07	83.1	14 21	63 06	82.8	14 13	62 04	82.6	14 05	61 03	82.3	13 57	60 02	82.1	196	344
17	163	15 29	65 02	82.9	15 22	64 00	82.6	15 14	62 59	82.4	15 06	61 57	82.1	14 58	60 56	81.8	14 49	59 54	81.6	197	343
18	162	16 24	64 55	82.5	16 16	63 53	82.2	16 08	62 51	81.9	15 59	61 49	81.6	15 50	60 47	81.3	15 41	59 46	81.0	198	342
19	161	17 18	64 47	82.0	17 10	63 45	81.7	17 01	62 43	81.4	16 52	61 41	81.1	16 42	60 39	80.8	16 33	59 37	80.5	199	341
20	160	18 12	64 39	81.6	18 03	63 36	81.3	17 54	62 34	80.9	17 45	61 32	80.6	17 35	60 30	80.3	17 24	59 28	80.0	200	340
21	159	19 07	64 30	81.1	18 57	63 28	80.8	18 47	62 25	80.4	18 37	61 23	80.1	18 27	60 20	79.8	18 16	59 18	79.5	201	339
22	158	20 01	64 21	80.7	19 51	63 18	80.3	19 41	62 15	80.0	19 30	61 13	79.6	19 19	60 10	79.3	19 08	59 08	78.9	202	338
23	157	20 55	64 11	80.2	20 44	63 08	79.8	20 34	62 05	79.5	20 22	61 02	79.1	20 11	59 59	78.7	19 59	58 57	78.4	203	337
24	156	21 49	64 01	79.7	21 38	62 58	79.3	21 27	61 54	79.0	21 15	60 51	78.6	21 03	59 48	78.2	20 50	58 45	77.8	204	336
25	155	22 43	63 50	79.3	22 31	62 46	78.9	22 19	61 43	78.4	22 07	60 39	78.0	21 55	59 36	77.7	21 42	58 33	77.3	205	335
26	154	23 36	63 39	78.8	23 25	62 35	78.4	23 12	61 31	77.9	22 59	60 27	77.5	22 46	59 24	77.1	22 33	58 20	76.7	206	334
27	153	24 30	63 27	78.3	24 18	62 22	77.8	24 05	61 18	77.4	23 52	60 14	77.0	23 38	59 10	76.5	23 24	58 07	76.1	207	333
28	152	25 24	63 14	77.8	25 11	62 10	77.3	24 57	61 05	76.9	24 44	60 01	76.4	24 29	58 57	76.0	24 15	57 53	75.5	208	332
29	151	26 17	63 01	77.3	26 04	61 56	76.8	25 50	60 51	76.3	25 36	59 47	75.9	25 21	58 42	75.4	25 05	57 38	75.0	209	331
30	150	27 11	62 48	76.8	26 57	61 42	76.3	26 42	60 37	75.8	26 27	59 32	75.3	26 12	58 27	74.8	25 56	57 23	74.4	210	330
31	149	28 04	62 33	76.3	27 50	61 27	75.8	27 35	60 22	75.2	27 19	59 16	74.7	27 03	58 11	74.2	26 46	57 07	73.8	211	329
32	148	28 57	62 18	75.7	28 42	61 12	75.2	28 27	60 06	74.7	28 10	59 00	74.2	27 54	57 55	73.7	27 37	56 50	73.1	212	328
33	147	29 50	62 02	75.2	29 35	60 56	74.7	29 19	59 49	74.1	29 02	58 43	73.6	28 45	57 38	73.0	28 27	56 32	72.5	213	327
34	146	30 43	61 46	74.7	30 27	60 39	74.1	30 10	59 32	73.5	29 53	58 26	73.0	29 35	57 20	72.4	29 17	56 14	71.9	214	326
35	145	31 36	61 28	74.1	31 19	60 21	73.5	31 02	59 14	72.9	30 44	58 07	72.4	30 26	57 01	71.8	30 07	55 55	71.2	215	325
36	144	32 29	61 10	73.5	32 11	60 02	72.9	31 53	58 55	72.3	31 35	57 48	71.7	31 16	56 41	71.2	30 56	55 35	70.6	216	324
37	143	33 21	60 52	73.0	33 03	59 43	72.3	32 45	58 35	71.7	32 26	57 28	71.1	32 06	56 21	70.5	31 46	55 14	69.9	217	323
38	142	34 13	60 32	72.4	33 55	59 23	71.7	33 36	58 15	71.1	33 16	57 07	70.5	32 56	55 59	69.9	32 35	54 53	69.3	218	322
39	141	35 06	60 11	71.8	34 47	59 02	71.1	34 27	57 53	70.5	34 06	56 45	69.8	33 45	55 37	69.2	33 24	54 30	68.6	219	321
40	140	35 58	59 50	71.2	35 38	58 40	70.5	35 17	57 31	69.8	34 56	56 22	69.1	34 35	55 14	68.5	34 12	54 07	67.9	220	320
41	139	36 49	59 28	70.5	36 29	58 17	69.8	36 08	57 08	69.1	35 46	55 59	68.5	35 24	54 50	67.8	35 01	53 42	67.1	221	319
42	138	37 41	59 04	69.9	37 20	57 54	69.2	36 58	56 43	68.5	36 36	55 34	67.8	36 13	54 25	67.1	35 49	53 17	66.4	222	318
43	137	38 32	58 40	69.2	38 11	57 29	68.5	37 48	56 18	67.8	37 25	55 08	67.1	37 02	53 59	66.4	36 37	52 50	65.7	223	317
44	136	39 23	58 15	68.6	39 01	57 03	67.8	38 38	55 52	67.1	38 14	54 41	66.3	37 50	53 32	65.6	37 25	52 23	64.9	224	316
45	135	40 14	57 48	67.9	39 51	56 36	67.1	39 28	55 24	66.3	39 03	54 13	65.6	38 38	53 04	64.9	38 12	51 54	64.1	225	315

Lat. / A		24°			25°			26°			27°			28°			29°			Lat. / A	
AHL / F		A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	AHL	
°	°	° ′	° ′	°	° ′	° ′	°	° ′	° ′	°	° ′	° ′	°	° ′	° ′	°	° ′	° ′	°	°	°
45	135	40 14	57 48	67.9	39 51	56 36	67.1	39 28	55 24	66.3	39 03	54 13	65.6	38 38	53 04	64.9	38 12	51 54	64.1	225	315
46	134	41 05	57 21	67.2	40 41	56 08	66.4	40 17	54 56	65.6	39 52	53 44	64.8	39 26	52 34	64.1	38 59	51 25	63.3	226	314
47	133	41 55	56 52	66.4	41 31	55 38	65.6	41 06	54 26	64.8	40 40	53 14	64.0	40 13	52 04	63.3	39 46	50 54	62.5	227	313
48	132	42 45	56 22	65.7	42 20	55 08	64.9	41 54	53 55	64.0	41 28	52 43	63.2	41 00	51 32	62.5	40 32	50 22	61.7	228	312
49	131	43 35	55 50	64.9	43 09	54 36	64.1	42 43	53 22	63.2	42 15	52 10	62.4	41 47	50 59	61.6	41 18	49 48	60.9	229	311
50	130	44 25	55 17	64.1	43 58	54 02	63.3	43 31	52 49	62.4	43 03	51 36	61.6	42 34	50 24	60.8	42 04	49 14	60.0	230	310
51	129	45 14	54 43	63.3	44 47	53 28	62.4	44 18	52 13	61.6	43 49	51 00	60.7	43 20	49 48	59.9	42 49	48 38	59.1	231	309
52	128	46 03	54 08	62.5	45 35	52 52	61.6	45 06	51 37	60.7	44 36	50 23	59.8	44 05	49 11	59.0	43 34	48 00	58.2	232	308
53	127	46 51	53 30	61.6	46 22	52 14	60.7	45 52	50 59	59.8	45 22	49 45	58.9	44 51	48 32	58.1	44 18	47 21	57.2	233	307
54	126	47 39	52 51	60.8	47 09	51 34	59.8	46 39	50 19	58.9	46 07	49 05	58.0	45 35	47 52	57.1	45 02	46 41	56.3	234	306
55	125	48 27	52 11	59.8	47 56	50 53	58.9	47 25	49 37	58.0	46 53	48 23	57.0	46 19	47 10	56.2	45 46	45 59	55.3	235	305
56	124	49 14	51 28	58.9	48 43	50 11	57.9	48 10	48 54	57.0	47 37	47 40	56.1	47 03	46 27	55.2	46 29	45 15	54.3	236	304
57	123	50 01	50 44	57.9	49 28	49 26	56.9	48 55	48 09	56.0	48 21	46 54	55.0	47 46	45 41	54.1	47 11	44 30	53.3	237	303
58	122	50 47	49 58	56.9	50 14	48 39	55.9	49 40	47 22	54.9	49 05	46 07	54.0	48 29	44 54	53.1	47 53	43 43	52.2	238	302
59	121	51 33	49 09	55.9	50 58	47 51	54.9	50 23	46 34	53.9	49 48	45 18	52.9	49 11	44 05	52.0	48 34	42 54	51.1	239	301
60	120	52 18	48 19	54.8	51 43	47 00	53.8	51 07	45 43	52.8	50 30	44 28	51.8	49 53	43 14	50.9	49 14	42 03	50.0	240	300
61	119	53 02	47 26	53.7	52 26	46 07	52.7	51 49	44 50	51.7	51 12	43 35	50.7	50 33	42 22	49.7	49 54	41 10	48.8	241	299
62	118	53 46	46 31	52.6	53 09	45 12	51.5	52 31	43 54	50.5	51 53	42 39	49.5	51 13	41 27	48.6	50 33	40 16	47.6	242	298
63	117	54 29	45 33	51.4	53 51	44 14	50.3	53 13	42 57	49.3	52 33	41 42	48.3	51 53	40 30	47.3	51 12	39 19	46.4	243	297
64	116	55 12	44 33	50.2	54 33	43 14	49.1	53 53	41 57	48.1	53 13	40 42	47.1	52 31	39 30	46.1	51 49	38 20	45.2	244	296
65	115	55 53	43 30	48.9	55 13	42 11	47.8	54 33	40 55	46.8	53 51	39 40	45.8	53 09	38 29	44.8	52 26	37 19	43.9	245	295
66	114	56 34	42 25	47.6	55 53	41 06	46.5	55 12	39 50	45.4	54 29	38 36	44.4	53 46	37 25	43.5	53 02	36 16	42.6	246	294
67	113	57 14	41 16	46.2	56 32	39 58	45.1	55 50	38 42	44.1	55 06	37 29	43.1	54 22	36 19	42.1	53 37	35 11	41.2	247	293
68	112	57 53	40 05	44.8	57 10	38 47	43.7	56 27	37 32	42.7	55 42	36 19	41.7	54 57	35 10	40.7	54 11	34 03	39.8	248	292
69	111	58 32	38 50	43.3	57 47	37 33	42.2	57 03	36 18	41.2	56 17	35 07	40.2	55 31	33 59	39.3	54 44	32 53	38.4	249	291
70	110	59 09	37 32	41.8	58 23	36 16	40.7	57 38	35 02	39.7	56 51	33 52	38.7	56 04	32 45	37.8	55 16	31 41	36.9	250	290
71	109	59 45	36 11	40.2	58 58	34 55	39.2	58 12	33 43	38.1	57 24	32 35	37.2	56 36	31 29	36.3	55 47	30 26	35.4	251	289
72	108	60 19	34 46	38.6	59 32	33 32	37.6	58 44	32 21	36.5	57 56	31 14	35.6	57 07	30 10	34.7	56 17	29 08	33.8	252	288
73	107	60 53	33 18	36.9	60 05	32 05	35.9	59 16	30 56	34.9	58 26	29 51	34.0	57 36	28 48	33.1	56 46	27 49	32.2	253	287
74	106	61 25	31 46	35.2	60 36	30 35	34.2	59 46	29 28	33.2	58 55	28 25	32.3	58 05	27 24	31.4	57 13	26 26	30.6	254	286
75	105	61 56	30 10	33.4	61 06	29 02	32.4	60 15	27 57	31.4	59 23	26 56	30.5	58 31	25 57	29.7	57 39	25 02	28.9	255	285
76	104	62 26	28 31	31.5	61 34	27 25	30.5	60 42	26 23	29.6	59 50	25 24	28.8	58 57	24 28	28.0	58 04	23 35	27.2	256	284
77	103	62 53	26 48	29.6	62 01	25 45	28.6	61 08	24 46	27.8	60 15	23 49	27.0	59 21	22 56	26.2	58 27	22 05	25.5	257	283
78	102	63 20	25 02	27.6	62 26	24 02	26.7	61 32	23 05	25.9	60 38	22 12	25.1	59 44	21 21	24.4	58 49	20 34	23.7	258	282
79	101	63 44	23 12	25.5	62 50	22 15	24.7	61 55	21 22	23.9	61 00	20 32	23.2	60 05	19 44	22.5	59 09	19 00	21.8	259	281
80	100	64 07	21 18	23.4	63 12	20 25	22.6	62 16	19 36	21.9	61 20	18 49	21.2	60 24	18 05	20.6	59 28	17 24	20.0	260	280
81	99	64 28	19 22	21.3	63 32	18 33	20.5	62 35	17 47	19.9	61 39	17 04	19.2	60 42	16 24	18.6	59 45	15 46	18.1	261	279
82	98	64 47	17 22	19.1	63 50	16 37	18.4	62 53	15 56	17.8	61 56	15 17	17.2	60 58	14 40	16.7	60 01	14 06	16.2	262	278
83	97	65 03	15 18	16.8	64 06	14 39	16.2	63 08	14 02	15.6	62 10	13 27	15.1	61 12	12 55	14.7	60 14	12 24	14.2	263	277
84	96	65 18	13 13	14.5	64 20	12 38	14.0	63 22	12 06	13.5	62 23	11 36	13.0	61 25	11 07	12.6	60 26	10 41	12.2	264	276
85	95	65 31	11 05	12.1	64 32	10 35	11.7	63 33	10 08	11.3	62 35	9 42	10.9	61 36	9 19	10.6	60 37	8 56	10.2	265	275
86	94	65 41	8 54	9.8	64 42	8 30	9.4	63 43	8 08	9.1	62 44	7 48	8.8	61 44	7 28	8.5	60 45	7 10	8.2	266	274
87	93	65 49	6 42	7.3	64 50	6 24	7.1	63 50	6 07	6.8	62 51	5 52	6.6	61 51	5 37	6.4	60 52	5 24	6.2	267	273
88	92	65 55	4 29	4.9	64 56	4 17	4.7	63 56	4 06	4.6	62 56	3 55	4.4	61 56	3 45	4.3	60 56	3 36	4.1	268	272
89	91	65 59	2 15	2.5	64 59	2 09	2.4	63 59	2 03	2.3	62 59	1 58	2.2	61 59	1 53	2.1	60 59	1 48	2.1	269	271
90	90	66 00	0 00	0.0	65 00	0 00	0.0	64 00	0 00	0.0	63 00	0 00	0.0	62 00	0 00	0.0	61 00	0 00	0.0	270	270

Lat. N.: para AHL > 180°... $Z_n = Z$
para AHL < 180°... $Z_n = 360° - Z$

Lat. S.: para AHL > 180°... $Z_n = 180° - Z$
para AHL < 180°... $Z_n = 180° + Z$

B : (–) para 90° < AHL < 270°
Dec : (–) para la Lat. con signo contrario

TABLA PARA REDUCCION DE VISUALES

Z_1 : mismo signo que B
Z_2 : (–) para F > 90°

Lat. / A	30°			31°			32°			33°			34°			35°			Lat. / A
AHL / F	A / H	B / P	Z_1/Z_2	A / H	B / P	Z_1/Z_2	A / H	B / P	Z_1/Z_2	A / H	B / P	Z_1/Z_2	A / H	B / P	Z_1/Z_2	A / H	B / P	Z_1/Z_2	AHL
° °	° ′	° ′	°	° ′	° ′	°	° ′	° ′	°	° ′	° ′	°	° ′	° ′	°	° ′	° ′	°	° °
0 180	0 00	60 00	90.0	0 00	59 00	90.0	0 00	58 00	90.0	0 00	57 00	90.0	0 00	56 00	90.0	0 00	55 00	90.0	180 360
1 179	0 52	60 00	89.5	0 51	59 00	89.5	0 51	58 00	89.5	0 50	57 00	89.5	0 50	56 00	89.4	0 49	55 00	89.4	181 359
2 178	1 44	59 59	89.0	1 43	58 59	89.0	1 42	57 59	88.9	1 41	56 59	88.9	1 39	55 59	88.9	1 38	54 59	88.9	182 358
3 177	2 36	59 58	88.5	2 34	58 58	88.5	2 33	57 58	88.4	2 31	56 58	88.4	2 29	55 58	88.3	2 27	54 58	88.3	183 357
4 176	3 28	59 56	88.0	3 26	58 56	87.9	3 23	57 56	87.9	3 21	56 56	87.8	3 19	55 56	87.8	3 17	54 56	87.7	184 356
5 175	4 20	59 54	87.5	4 17	58 54	87.4	4 14	57 54	87.3	4 12	56 54	87.3	4 09	55 54	87.2	4 06	54 54	87.1	185 355
6 174	5 12	59 52	87.0	5 08	58 52	86.9	5 05	57 52	86.8	5 02	56 51	86.7	4 58	55 51	86.6	4 55	54 51	86.6	186 354
7 173	6 04	59 49	86.5	6 00	58 49	86.4	5 56	57 48	86.3	5 52	56 48	86.2	5 48	55 48	86.1	5 44	54 48	86.0	187 353
8 172	6 55	59 45	86.0	6 51	58 45	85.9	6 47	57 45	85.7	6 42	56 45	85.6	6 38	55 44	85.5	6 33	54 44	85.4	188 352
9 171	7 47	59 42	85.5	7 42	58 41	85.3	7 37	57 41	85.2	7 32	56 40	85.1	7 27	55 40	84.9	7 22	54 40	84.8	189 351
10 170	8 39	59 37	85.0	8 34	58 37	84.8	8 28	57 36	84.7	8 22	56 36	84.5	8 17	55 36	84.4	8 11	54 35	84.2	190 350
11 169	9 31	59 32	84.4	9 25	58 32	84.3	9 19	57 31	84.1	9 13	56 31	84.0	9 06	55 30	83.8	9 00	54 30	83.6	191 349
12 168	10 22	59 27	83.9	10 16	58 26	83.8	10 09	57 26	83.6	10 03	56 25	83.4	9 56	55 25	83.2	9 48	54 24	83.0	192 348
13 167	11 14	59 21	83.4	11 07	58 20	83.2	11 00	57 20	83.0	10 52	56 19	82.8	10 45	55 18	82.6	10 37	54 18	82.5	193 347
14 166	12 06	59 15	82.9	11 58	58 14	82.7	11 50	57 13	82.5	11 42	56 12	82.3	11 34	55 12	82.1	11 26	54 11	81.9	194 346
15 165	12 57	59 08	82.4	12 49	58 07	82.1	12 41	57 06	81.9	12 32	56 05	81.7	12 23	55 04	81.5	12 14	54 04	81.3	195 345
16 164	13 49	59 01	81.8	13 40	57 59	81.6	13 31	56 58	81.4	13 22	55 57	81.1	13 13	54 57	80.9	13 03	53 56	80.7	196 344
17 163	14 40	58 53	81.3	14 31	57 51	81.1	14 21	56 50	80.8	14 12	55 49	80.5	14 02	54 48	80.3	13 51	53 47	80.1	197 343
18 162	15 31	58 44	80.8	15 22	57 43	80.5	15 12	56 42	80.2	15 01	55 40	80.0	14 51	54 39	79.7	14 40	53 38	79.4	198 342
19 161	16 23	58 35	80.2	16 12	57 34	79.9	16 02	56 32	79.7	15 51	55 31	79.4	15 40	54 30	79.1	15 28	53 29	78.8	199 341
20 160	17 14	58 26	79.7	17 03	57 24	79.4	16 52	56 23	79.1	16 40	55 21	78.8	16 28	54 20	78.5	16 16	53 19	78.2	200 340
21 159	18 05	58 16	79.1	17 53	57 14	78.8	17 42	56 12	78.5	17 29	55 11	78.2	17 17	54 09	77.9	17 04	53 08	77.6	201 339
22 158	18 56	58 05	78.6	18 44	57 03	78.2	18 31	56 01	77.9	18 19	55 00	77.6	18 06	53 58	77.3	17 52	52 56	77.0	202 338
23 157	19 47	57 54	78.0	19 34	56 52	77.7	19 21	55 50	77.3	19 08	54 48	77.0	18 54	53 46	76.6	18 40	52 44	76.3	203 337
24 156	20 37	57 42	77.4	20 24	56 40	77.1	20 11	55 38	76.7	19 57	54 36	76.4	19 42	53 34	76.0	19 28	52 32	75.7	204 336
25 155	21 28	57 30	76.9	21 14	56 27	76.5	21 00	55 25	76.1	20 46	54 23	75.7	20 31	53 21	75.4	20 15	52 19	75.0	205 335
26 154	22 19	57 17	76.3	22 04	56 14	75.9	21 49	55 12	75.5	21 34	54 09	75.1	21 19	53 07	74.7	21 03	52 05	74.4	206 334
27 153	23 09	57 03	75.7	22 54	56 00	75.3	22 39	54 57	74.9	22 23	53 55	74.5	22 07	52 52	74.1	21 50	51 50	73.7	207 333
28 152	23 59	56 49	75.1	23 44	55 46	74.7	23 28	54 43	74.3	23 11	53 40	73.8	22 54	52 37	73.4	22 37	51 35	73.0	208 332
29 151	24 50	56 34	74.5	24 33	55 31	74.1	24 17	54 27	73.6	23 59	53 24	73.2	23 42	52 22	72.8	23 24	51 19	72.4	209 331
30 150	25 40	56 19	73.9	25 23	55 15	73.4	25 05	54 11	73.0	24 48	53 08	72.5	24 29	52 05	72.1	24 11	51 03	71.7	210 330
31 149	26 29	56 02	73.3	26 12	54 58	72.8	25 54	53 54	72.3	25 35	52 51	71.9	25 17	51 48	71.4	24 57	50 45	71.0	211 329
32 148	27 19	55 45	72.6	27 01	54 41	72.2	26 42	53 37	71.7	26 23	52 33	71.2	26 04	51 30	70.7	25 44	50 27	70.3	212 328
33 147	28 09	55 27	72.0	27 50	54 23	71.5	27 31	53 19	71.0	27 11	52 15	70.5	26 50	51 12	70.0	26 30	50 08	69.6	213 327
34 146	28 58	55 09	71.4	28 38	54 04	70.8	28 19	53 00	70.3	27 58	51 56	69.8	27 37	50 52	69.3	27 16	49 49	68.8	214 326
35 145	29 47	54 49	70.7	29 27	53 44	70.2	29 06	52 40	69.6	28 45	51 36	69.1	28 24	50 32	68.6	28 01	49 29	68.1	215 325
36 144	30 36	54 29	70.0	30 15	53 24	69.5	29 54	52 19	68.9	29 32	51 15	68.4	29 10	50 11	67.9	28 47	49 07	67.4	216 324
37 143	31 25	54 08	69.4	31 03	53 03	68.8	30 41	51 58	68.2	30 19	50 53	67.7	29 56	49 49	67.2	29 32	48 45	66.6	217 323
38 142	32 13	53 46	68.7	31 51	52 40	68.1	31 28	51 35	67.5	31 05	50 30	66.9	30 41	49 26	66.4	30 17	48 23	65.9	218 322
39 141	33 02	53 23	68.0	32 39	52 17	67.4	32 15	51 12	66.8	31 51	50 07	66.2	31 27	49 03	65.6	31 02	47 59	65.1	219 321
40 140	33 50	53 00	67.2	33 26	51 53	66.6	33 02	50 48	66.0	32 37	49 43	65.4	32 12	48 38	64.9	31 46	47 34	64.3	220 320
41 139	34 37	52 35	66.5	34 13	51 29	65.9	33 48	50 23	65.3	33 23	49 17	64.7	32 57	48 13	64.1	32 30	47 09	63.5	221 319
42 138	35 25	52 09	65.8	35 00	51 03	65.1	34 34	49 56	64.5	34 08	48 51	63.9	33 42	47 46	63.3	33 14	46 42	62.7	222 318
43 137	36 12	51 43	65.0	35 46	50 36	64.3	35 20	49 29	63.7	34 53	48 24	63.1	34 26	47 19	62.5	33 58	46 15	61.9	223 317
44 136	36 59	51 15	64.2	36 33	50 08	63.6	36 06	49 01	62.9	35 38	47 55	62.3	35 10	46 51	61.6	34 41	45 46	61.0	224 316
45 135	37 46	50 46	63.4	37 19	49 39	62.7	36 51	48 32	62.1	36 22	47 26	61.4	35 53	46 21	60.8	35 24	45 17	60.2	225 315

Lat. / A		30°			31°			32°			33°			34°			35°			Lat. / A	
AHL / F		A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	AHL	
°	°	° ′	° ′	°	° ′	° ′	°	° ′	° ′	°	° ′	° ′	°	° ′	° ′	°	° ′	° ′	°	°	°
45	135	37 46	50 46	63.4	37 19	49 39	62.7	36 51	48 32	62.1	36 22	47 26	61.4	35 53	46 21	60.8	35 24	45 17	60.2	225	315
46	134	38 32	50 16	62.6	38 04	49 08	61.9	37 36	48 02	61.2	37 06	46 56	60.6	36 37	45 51	59.9	36 06	44 46	59.3	226	314
47	133	39 18	49 45	61.8	38 49	48 37	61.1	38 20	47 30	60.4	37 50	46 24	59.7	37 19	45 19	59.1	36 48	44 15	58.4	227	313
48	132	40 04	49 13	61.0	39 34	48 05	60.2	39 04	46 58	59.5	38 33	45 51	58.8	38 02	44 46	58.2	37 30	43 42	57.5	228	312
49	131	40 49	48 39	60.1	40 19	47 31	59.4	39 48	46 24	58.6	39 16	45 18	57.9	38 44	44 12	57.2	38 11	43 08	56.6	229	311
50	130	41 34	48 04	59.2	41 03	46 56	58.5	40 31	45 49	57.7	39 59	44 42	57.0	39 26	43 37	56.3	38 52	42 33	55.6	230	310
51	129	42 18	47 28	58.3	41 46	46 20	57.5	41 14	45 12	56.8	40 41	44 06	56.1	40 07	43 01	55.4	39 32	41 57	54.7	231	309
52	128	43 02	46 50	57.4	42 29	45 42	56.6	41 56	44 34	55.9	41 22	43 28	55.1	40 47	42 23	54.4	40 12	41 19	53.7	232	308
53	127	43 46	46 11	56.4	43 12	45 03	55.6	42 38	43 55	54.9	42 03	42 49	54.1	41 28	41 44	53.4	40 52	40 41	52.7	233	307
54	126	44 29	45 31	55.5	43 54	44 22	54.7	43 19	43 15	53.9	42 44	42 09	53.1	42 07	41 04	52.4	41 30	40 01	51.7	234	306
55	125	45 11	44 49	54.5	44 36	43 40	53.7	44 00	42 33	52.9	43 24	41 27	52.1	42 46	40 23	51.4	42 09	39 19	50.7	235	305
56	124	45 53	44 05	53.5	45 17	42 57	52.6	44 40	41 50	51.8	44 03	40 44	51.1	43 25	39 40	50.3	42 46	38 37	49.6	236	304
57	123	46 35	43 20	52.4	45 58	42 11	51.6	45 20	41 05	50.8	44 42	39 59	50.0	44 03	38 55	49.3	43 24	37 53	48.5	237	303
58	122	47 16	42 33	51.3	46 38	41 25	50.5	45 59	40 18	49.7	45 20	39 13	48.9	44 40	38 09	48.2	44 00	37 07	47.5	238	302
59	121	47 56	41 44	50.2	47 17	40 36	49.4	46 38	39 30	48.6	45 58	38 25	47.8	45 17	37 22	47.1	44 36	36 20	46.3	239	301
60	120	48 35	40 54	49.1	47 56	39 46	48.3	47 16	38 40	47.5	46 35	37 36	46.7	45 53	36 33	45.9	45 11	35 32	45.2	240	300
61	119	49 14	40 01	47.9	48 34	38 54	47.1	47 53	37 48	46.3	47 11	36 45	45.5	46 29	35 42	44.7	45 46	34 42	44.0	241	299
62	118	49 53	39 07	46.8	49 11	38 00	45.9	48 29	36 55	45.1	47 46	35 52	44.3	47 03	34 50	43.6	46 19	33 50	42.8	242	298
63	117	50 30	38 11	45.5	49 48	37 04	44.7	49 05	36 00	43.9	48 21	34 57	43.1	47 37	33 57	42.3	46 53	32 57	41.6	243	297
64	116	51 07	37 13	44.3	50 23	36 07	43.4	49 40	35 03	42.6	48 55	34 01	41.8	48 10	33 01	41.1	47 25	32 03	40.4	244	296
65	115	51 43	36 12	43.0	50 58	35 07	42.2	50 14	34 04	41.3	49 28	33 03	40.6	48 43	32 04	39.8	47 56	31 07	39.1	245	295
66	114	52 18	35 10	41.7	51 33	34 06	40.8	50 47	33 04	40.0	50 01	32 04	39.3	49 14	31 05	38.5	48 27	30 09	37.8	246	294
67	113	52 52	34 05	40.3	52 06	33 02	39.5	51 19	32 01	38.7	50 32	31 02	37.9	49 44	30 05	37.2	48 56	29 10	36.5	247	293
68	112	53 25	32 59	38.9	52 38	31 56	38.1	51 50	30 57	37.3	51 02	29 59	36.6	50 14	29 03	35.8	49 25	28 09	35.2	248	292
69	111	53 57	31 50	37.5	53 09	30 49	36.7	52 21	29 50	35.9	51 32	28 53	35.2	50 43	27 59	34.5	49 53	27 06	33.8	249	291
70	110	54 28	30 39	36.1	53 39	29 39	35.2	52 50	28 42	34.5	52 00	27 46	33.8	51 10	26 53	33.1	50 20	26 02	32.4	250	290
71	109	54 58	29 25	34.6	54 08	28 27	33.8	53 18	27 31	33.0	52 28	26 38	32.3	51 37	25 46	31.6	50 46	24 56	31.0	251	289
72	108	55 27	28 09	33.0	54 37	27 13	32.2	53 46	26 19	31.5	52 54	25 27	30.8	52 03	24 37	30.2	51 10	23 49	29.5	252	288
73	107	55 55	26 51	31.4	55 03	25 57	30.7	54 12	25 04	30.0	53 19	24 14	29.3	52 27	23 26	28.7	51 34	22 40	28.1	253	287
74	106	56 21	25 31	29.8	55 29	24 39	29.1	54 36	23 48	28.4	53 43	23 00	27.8	52 50	22 14	27.1	51 57	21 29	26.6	254	286
75	105	56 46	24 09	28.2	55 53	23 18	27.5	55 00	22 30	26.8	54 06	21 44	26.2	53 12	21 00	25.6	52 18	20 17	25.0	255	285
76	104	57 10	22 44	26.5	56 16	21 56	25.8	55 22	21 10	25.2	54 28	20 26	24.6	53 33	19 44	24.0	52 38	19 04	23.5	256	284
77	103	57 33	21 17	24.8	56 38	20 31	24.1	55 43	19 48	23.5	54 48	19 06	23.0	53 53	18 27	22.4	52 57	17 49	21.9	257	283
78	102	57 54	19 48	23.0	56 59	19 05	22.4	56 03	18 24	21.9	55 07	17 45	21.3	54 11	17 08	20.8	53 15	16 32	20.3	258	282
79	101	58 13	18 17	21.2	57 17	17 37	20.7	56 21	16 59	20.1	55 25	16 22	19.6	54 28	15 48	19.2	53 31	15 15	18.7	259	281
80	100	58 32	16 44	19.4	57 35	16 07	18.9	56 38	15 32	18.4	55 41	14 58	17.9	54 44	14 26	17.5	53 47	13 56	17.1	260	280
81	99	58 48	15 10	17.6	57 51	14 36	17.1	56 53	14 03	16.6	55 56	13 33	16.2	54 58	13 03	15.8	54 00	12 36	15.4	261	279
82	98	59 03	13 33	15.7	58 05	13 02	15.3	57 07	12 33	14.9	56 09	12 06	14.5	55 11	11 40	14.1	54 13	11 14	13.8	262	278
83	97	59 16	11 55	13.8	58 18	11 28	13.4	57 19	11 02	13.0	56 21	10 38	12.7	55 22	10 14	12.4	54 24	9 52	12.1	263	277
84	96	59 28	10 16	11.9	58 29	9 52	11.5	57 30	9 30	11.2	56 31	9 09	10.9	55 32	8 49	10.6	54 33	8 29	10.4	264	276
85	95	59 37	8 35	9.9	58 38	8 15	9.6	57 39	7 56	9.4	56 40	7 39	9.1	55 41	7 22	8.9	54 41	7 06	8.7	265	275
86	94	59 46	6 53	8.0	58 46	6 37	7.7	57 47	6 22	7.5	56 47	6 08	7.3	55 48	5 54	7.1	54 48	5 41	7.0	266	274
87	93	59 52	5 11	6.0	58 52	4 59	5.8	57 52	4 47	5.6	56 53	4 36	5.5	55 53	4 26	5.4	54 53	4 16	5.2	267	273
88	92	59 56	3 28	4.0	58 57	3 19	3.9	57 57	3 12	3.8	56 57	3 05	3.7	55 57	2 58	3.6	54 57	2 51	3.5	268	272
89	91	59 59	1 44	2.0	58 59	1 40	1.9	57 59	1 36	1.9	56 59	1 32	1.8	55 59	1 29	1.8	54 59	1 26	1.7	269	271
90	90	60 00	0 00	0.0	59 00	0 00	0.0	58 00	0 00	0.0	57 00	0 00	0.0	56 00	0 00	0.0	55 00	0 00	0.0	270	270

Lat. N.: para AHL > 180°... $Z_n = Z$
para AHL < 180°... $Z_n = 360° - Z$

Lat. S.: para AHL > 180°... $Z_n = 180° - Z$
para AHL < 180°... $Z_n = 180° + Z$

B : (–) para 90° < AHL < 270°
Dec : (–) para la Lat. con signo contrario

TABLA PARA REDUCCION DE VISUALES

Z_1 : mismo signo que B
Z_2 : (–) para F > 90°

Lat. / A		36°			37°			38°			39°			40°			41°			Lat. / A	
AHL / F		A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	AHL	
°	°	° ′	° ′	°	° ′	° ′	°	° ′	° ′	°	° ′	° ′	°	° ′	° ′	°	° ′	° ′	°	°	°
0	180	0 00	54 00	90.0	0 00	53 00	90.0	0 00	52 00	90.0	0 00	51 00	90.0	0 00	50 00	90.0	0 00	49 00	90.0	180	360
1	179	0 49	54 00	89.4	0 48	53 00	89.4	0 47	52 00	89.4	0 47	51 00	89.4	0 46	50 00	89.4	0 45	49 00	89.3	181	359
2	178	1 37	53 59	88.8	1 36	52 59	88.8	1 35	51 59	88.8	1 33	50 59	88.7	1 32	49 59	88.7	1 31	48 59	88.7	182	358
3	177	2 26	53 58	88.2	2 24	52 58	88.2	2 22	51 58	88.2	2 20	50 58	88.1	2 18	49 58	88.1	2 16	48 58	88.0	183	357
4	176	3 14	53 56	87.6	3 12	52 56	87.6	3 09	51 56	87.5	3 06	50 56	87.5	3 04	49 56	87.4	3 01	48 56	87.4	184	356
5	175	4 03	53 54	87.1	3 59	52 54	87.0	3 56	51 54	86.9	3 53	50 54	86.8	3 50	49 54	86.8	3 46	48 54	86.7	185	355
6	174	4 51	53 51	86.5	4 47	52 51	86.4	4 43	51 51	86.3	4 40	50 51	86.2	4 36	49 51	86.1	4 31	48 51	86.1	186	354
7	173	5 39	53 48	85.9	5 35	52 48	85.8	5 31	51 48	85.7	5 26	50 47	85.6	5 21	49 47	85.5	5 17	48 47	85.4	187	353
8	172	6 28	53 44	85.3	6 23	52 44	85.2	6 18	51 44	85.1	6 13	50 44	84.9	6 07	49 43	84.8	6 02	48 43	84.7	188	352
9	171	7 16	53 40	84.7	7 11	52 39	84.6	7 05	51 39	84.4	6 59	50 39	84.3	6 53	49 39	84.2	6 47	48 39	84.1	189	351
10	170	8 05	53 35	84.1	7 58	52 35	83.9	7 52	51 34	83.8	7 45	50 34	83.7	7 39	49 34	83.5	7 32	48 34	83.4	190	350
11	169	8 53	53 30	83.5	8 46	52 29	83.3	8 39	51 29	83.2	8 32	50 29	83.0	8 24	49 29	82.9	8 17	48 28	82.7	191	349
12	168	9 41	53 24	82.9	9 33	52 23	82.7	9 26	51 23	82.5	9 18	50 23	82.4	9 10	49 23	82.2	9 02	48 22	82.1	192	348
13	167	10 29	53 17	82.3	10 21	52 17	82.1	10 13	51 17	81.9	10 04	50 16	81.7	9 55	49 16	81.6	9 46	48 16	81.4	193	347
14	166	11 17	53 10	81.7	11 08	52 10	81.5	10 59	51 10	81.3	10 50	50 09	81.1	10 41	49 09	80.9	10 31	48 09	80.7	194	346
15	165	12 05	53 03	81.0	11 56	52 02	80.8	11 46	51 02	80.6	11 36	50 02	80.4	11 26	49 01	80.2	11 16	48 01	80.0	195	345
16	164	12 53	52 55	80.4	12 43	51 54	80.2	12 33	50 54	80.0	12 22	49 53	79.8	12 11	48 53	79.6	12 00	47 53	79.3	196	344
17	163	13 41	52 46	79.8	13 30	51 46	79.6	13 19	50 45	79.3	13 08	49 45	79.1	12 57	48 44	78.9	12 45	47 44	78.7	197	343
18	162	14 29	52 37	79.2	14 17	51 37	78.9	14 06	50 36	78.7	13 54	49 35	78.4	13 42	48 35	78.2	13 29	47 34	78.0	198	342
19	161	15 16	52 28	78.6	15 04	51 27	78.3	14 52	50 26	78.0	14 39	49 25	77.8	14 27	48 25	77.5	14 13	47 24	77.3	199	341
20	160	16 04	52 17	77.9	15 51	51 16	77.6	15 38	50 16	77.4	15 25	49 15	77.1	15 11	48 14	76.8	14 58	47 14	76.6	200	340
21	159	16 51	52 07	77.3	16 38	51 05	77.0	16 24	50 05	76.7	16 10	49 04	76.4	15 56	48 03	76.1	15 42	47 03	75.9	201	339
22	158	17 39	51 55	76.6	17 24	50 54	76.3	17 10	49 53	76.0	16 56	48 52	75.7	16 41	47 51	75.4	16 25	46 51	75.2	202	338
23	157	18 26	51 43	76.0	18 11	50 42	75.7	17 56	49 41	75.4	17 41	48 40	75.0	17 25	47 39	74.7	17 09	46 38	74.4	203	337
24	156	19 13	51 30	75.3	18 57	50 29	75.0	18 42	49 28	74.7	18 26	48 27	74.3	18 09	47 26	74.0	17 53	46 25	73.7	204	336
25	155	20 00	51 17	74.7	19 44	50 15	74.3	19 27	49 14	74.0	19 10	48 13	73.6	18 53	47 12	73.3	18 36	46 12	73.0	205	335
26	154	20 46	51 03	74.0	20 30	50 01	73.6	20 13	49 00	73.3	19 55	47 59	72.9	19 37	46 58	72.6	19 19	45 57	72.3	206	334
27	153	21 33	50 48	73.3	21 15	49 47	73.0	20 58	48 45	72.6	20 40	47 44	72.2	20 21	46 43	71.9	20 02	45 42	71.5	207	333
28	152	22 19	50 33	72.6	22 01	49 31	72.3	21 43	48 30	71.9	21 24	47 28	71.5	21 05	46 28	71.1	20 45	45 27	70.8	208	332
29	151	23 06	50 17	72.0	22 47	49 15	71.6	22 28	48 14	71.2	22 08	47 12	70.8	21 48	46 11	70.4	21 28	45 11	70.0	209	331
30	150	23 52	50 00	71.3	23 32	48 58	70.8	23 12	47 57	70.4	22 52	46 55	70.0	22 31	45 54	69.6	22 10	44 54	69.3	210	330
31	149	24 37	49 43	70.5	24 17	48 41	70.1	23 57	47 39	69.7	23 36	46 38	69.3	23 14	45 37	68.9	22 52	44 36	68.5	211	329
32	148	25 23	49 25	69.8	25 02	48 23	69.4	24 41	47 21	69.0	24 19	46 19	68.5	23 57	45 18	68.1	23 34	44 17	67.7	212	328
33	147	26 09	49 06	69.1	25 47	48 04	68.7	25 25	47 02	68.2	25 02	46 00	67.8	24 40	44 59	67.3	24 16	43 58	66.9	213	327
34	146	26 54	48 46	68.4	26 32	47 44	67.9	26 09	46 42	67.4	25 45	45 40	67.0	25 22	44 39	66.6	24 58	43 39	66.1	214	326
35	145	27 39	48 26	67.6	27 16	47 23	67.1	26 52	46 21	66.7	26 28	45 20	66.2	26 04	44 19	65.8	25 39	43 18	65.3	215	325
36	144	28 24	48 04	66.9	28 00	47 02	66.4	27 36	46 00	65.9	27 11	44 58	65.4	26 46	43 57	65.0	26 20	42 57	64.5	216	324
37	143	29 08	47 42	66.1	28 44	46 40	65.6	28 19	45 38	65.1	27 53	44 36	64.6	27 27	43 35	64.2	27 01	42 34	63.7	217	323
38	142	29 52	47 19	65.3	29 27	46 17	64.8	29 01	45 15	64.3	28 35	44 13	63.8	28 08	43 12	63.3	27 41	42 12	62.9	218	322
39	141	30 36	46 56	64.5	30 10	45 53	64.0	29 44	44 51	63.5	29 17	43 49	63.0	28 49	42 48	62.5	28 21	41 48	62.0	219	321
40	140	31 20	46 31	63.7	30 53	45 28	63.2	30 26	44 26	62.7	29 58	43 25	62.2	29 30	42 24	61.7	29 01	41 23	61.2	220	320
41	139	32 03	46 05	62.9	31 36	45 03	62.4	31 08	44 01	61.8	30 39	42 59	61.3	30 10	41 58	60.8	29 41	40 58	60.3	221	319
42	138	32 46	45 39	62.1	32 18	44 36	61.5	31 49	43 34	61.0	31 20	42 33	60.5	30 50	41 32	59.9	30 20	40 32	59.4	222	318
43	137	33 29	45 11	61.3	33 00	44 09	60.7	32 30	43 07	60.1	32 00	42 05	59.6	31 30	41 05	59.1	30 59	40 04	58.5	223	317
44	136	34 12	44 43	60.4	33 42	43 40	59.8	33 11	42 38	59.3	32 40	41 37	58.7	32 09	40 36	58.2	31 37	39 36	57.6	224	316
45	135	34 54	44 13	59.6	34 23	43 11	59.0	33 52	42 09	58.4	33 20	41 08	57.8	32 48	40 07	57.3	32 15	39 08	56.7	225	315

Lat. / A		36°			37°			38°			39°			40°			41°			Lat. / A	
AHL / F		A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	AHL	
°	°	° ′	° ′	°	° ′	° ′	°	° ′	° ′	°	° ′	° ′	°	° ′	° ′	°	° ′	° ′	°	°	°
45	135	34 54	44 13	59.6	34 23	43 11	59.0	33 52	42 09	58.4	33 20	41 08	57.8	32 48	40 07	57.3	32 15	39 08	56.7	225	315
46	134	35 35	43 43	58.7	35 04	42 40	58.1	34 32	41 38	57.5	33 59	40 37	56.9	33 26	39 37	56.4	32 53	38 38	55.8	226	314
47	133	36 17	43 11	57.8	35 44	42 09	57.2	35 12	41 07	56.6	34 38	40 06	56.0	34 04	39 06	55.4	33 30	38 07	54.9	227	313
48	132	36 57	42 39	56.9	36 24	41 36	56.2	35 51	40 35	55.6	35 17	39 34	55.0	34 42	38 34	54.5	34 07	37 35	53.9	228	312
49	131	37 38	42 05	55.9	37 04	41 03	55.3	36 30	40 01	54.7	35 55	39 01	54.1	35 19	38 01	53.5	34 43	37 03	53.0	229	311
50	130	38 18	41 30	55.0	37 43	40 28	54.4	37 08	39 27	53.7	36 32	38 27	53.1	35 56	37 27	52.5	35 19	36 29	52.0	230	310
51	129	38 57	40 54	54.0	38 22	39 52	53.4	37 46	38 51	52.8	37 09	37 51	52.1	36 32	36 52	51.6	35 55	35 54	51.0	231	309
52	128	39 36	40 17	53.0	39 00	39 15	52.4	38 23	38 14	51.8	37 46	37 15	51.1	37 08	36 16	50.6	36 30	35 18	50.0	232	308
53	127	40 15	39 38	52.0	39 38	38 37	51.4	39 00	37 36	50.8	38 22	36 37	50.1	37 43	35 39	49.5	37 04	34 42	49.0	233	307
54	126	40 53	38 58	51.0	40 15	37 57	50.4	39 36	36 57	49.7	38 57	35 58	49.1	38 18	35 01	48.5	37 38	34 04	47.9	234	306
55	125	41 30	38 17	50.0	40 52	37 17	49.3	40 12	36 17	48.7	39 32	35 19	48.1	38 52	34 21	47.4	38 11	33 25	46.9	235	305
56	124	42 07	37 35	48.9	41 28	36 35	48.3	40 47	35 36	47.6	40 07	34 38	47.0	39 26	33 41	46.4	38 44	32 45	45.8	236	304
57	123	42 44	36 51	47.9	42 03	35 51	47.2	41 22	34 53	46.5	40 41	33 55	45.9	39 59	32 59	45.3	39 16	32 04	44.7	237	303
58	122	43 19	36 06	46.8	42 38	35 07	46.1	41 56	34 09	45.4	41 14	33 12	44.8	40 31	32 16	44.2	39 48	31 22	43.6	238	302
59	121	43 54	35 20	45.6	43 12	34 21	45.0	42 29	33 24	44.3	41 46	32 27	43.7	41 03	31 32	43.1	40 19	30 39	42.5	239	301
60	120	44 29	34 32	44.5	43 46	33 34	43.8	43 02	32 37	43.2	42 18	31 42	42.5	41 34	30 47	41.9	40 49	29 54	41.3	240	300
61	119	45 02	33 43	43.3	44 18	32 45	42.6	43 34	31 49	42.0	42 49	30 55	41.4	42 04	30 01	40.8	41 18	29 09	40.2	241	299
62	118	45 35	32 52	42.1	44 51	31 55	41.5	44 05	31 00	40.8	43 20	30 06	40.2	42 34	29 14	39.6	41 47	28 22	39.0	242	298
63	117	46 07	32 00	40.9	45 22	31 04	40.3	44 36	30 10	39.6	43 49	29 17	39.0	43 03	28 25	38.4	42 15	27 35	37.8	243	297
64	116	46 39	31 06	39.7	45 52	30 11	39.0	45 06	29 18	38.4	44 18	28 26	37.8	43 31	27 35	37.2	42 43	26 46	36.6	244	296
65	115	47 09	30 11	38.4	46 22	29 17	37.8	45 35	28 25	37.1	44 47	27 34	36.5	43 58	26 44	36.0	43 09	25 56	35.4	245	295
66	114	47 39	29 14	37.1	46 51	28 21	36.5	46 03	27 30	35.9	45 14	26 40	35.3	44 25	25 52	34.7	43 35	25 04	34.2	246	294
67	113	48 08	28 16	35.8	47 19	27 24	35.2	46 30	26 34	34.6	45 40	25 45	34.0	44 50	24 58	33.4	44 00	24 12	32.9	247	293
68	112	48 36	27 17	34.5	47 46	26 26	33.9	46 56	25 37	33.3	46 06	24 50	32.7	45 15	24 03	32.2	44 24	23 19	31.6	248	292
69	111	49 03	26 15	33.1	48 13	25 26	32.5	47 22	24 38	31.9	46 31	23 52	31.4	45 39	23 08	30.8	44 48	22 24	30.3	249	291
70	110	49 29	25 13	31.8	48 38	24 25	31.2	47 46	23 39	30.6	46 55	22 54	30.0	46 03	22 11	29.5	45 10	21 29	29.0	250	290
71	109	49 54	24 08	30.4	49 02	23 22	29.8	48 10	22 37	29.2	47 17	21 54	28.7	46 25	21 12	28.2	45 32	20 32	27.7	251	289
72	108	50 18	23 02	28.9	49 25	22 18	28.4	48 33	21 35	27.8	47 39	20 53	27.3	46 46	20 13	26.8	45 52	19 34	26.3	252	288
73	107	50 41	21 55	27.5	49 48	21 12	26.9	48 54	20 31	26.4	48 00	19 51	25.9	47 06	19 13	25.4	46 12	18 35	25.0	253	287
74	106	51 03	20 47	26.0	50 09	20 06	25.5	49 15	19 26	25.0	48 20	18 48	24.5	47 25	18 11	24.0	46 30	17 36	23.6	254	286
75	105	51 24	19 36	24.5	50 29	18 57	24.0	49 34	18 20	23.5	48 39	17 43	23.1	47 44	17 09	22.6	46 48	16 35	22.2	255	285
76	104	51 43	18 25	23.0	50 48	17 48	22.5	49 52	17 12	22.0	48 57	16 38	21.6	48 01	16 05	21.2	47 05	15 33	20.8	256	284
77	103	52 02	17 12	21.4	51 06	16 37	21.0	50 09	16 04	20.6	49 13	15 31	20.1	48 17	15 00	19.8	47 20	14 31	19.4	257	283
78	102	52 19	15 58	19.9	51 22	15 25	19.5	50 25	14 54	19.0	49 29	14 24	18.7	48 32	13 55	18.3	47 35	13 27	18.0	258	282
79	101	52 35	14 43	18.3	51 37	14 13	17.9	50 40	13 43	17.5	49 43	13 16	17.2	48 46	12 49	16.8	47 48	12 23	16.5	259	281
80	100	52 49	13 27	16.7	51 52	12 59	16.3	50 54	12 32	16.0	49 56	12 06	15.7	48 58	11 42	15.3	48 01	11 18	15.0	260	280
81	99	53 02	12 09	15.1	52 04	11 44	14.7	51 06	11 19	14.4	50 08	10 56	14.1	49 10	10 34	13.8	48 12	10 12	13.6	261	279
82	98	53 14	10 51	13.4	52 16	10 28	13.1	51 18	10 06	12.9	50 19	9 45	12.6	49 20	9 25	12.3	48 22	9 06	12.1	262	278
83	97	53 25	9 31	11.8	52 26	9 11	11.5	51 27	8 52	11.3	50 29	8 34	11.0	49 30	8 16	10.8	48 31	7 59	10.6	263	277
84	96	53 34	8 11	10.1	52 35	7 54	9.9	51 36	7 37	9.7	50 37	7 21	9.5	49 38	7 06	9.3	48 38	6 51	9.1	264	276
85	95	53 42	6 50	8.5	52 43	6 36	8.3	51 43	6 22	8.1	50 44	6 09	7.9	49 44	5 56	7.8	48 45	5 44	7.6	265	275
86	94	53 49	5 29	6.8	52 49	5 17	6.6	51 49	5 06	6.5	50 50	4 55	6.3	49 50	4 45	6.2	48 50	4 35	6.1	266	274
87	93	53 54	4 07	5.1	52 54	3 58	5.0	51 54	3 50	4.9	50 54	3 42	4.8	49 54	3 34	4.7	48 55	3 27	4.6	267	273
88	92	53 57	2 45	3.4	52 57	2 39	3.3	51 57	2 33	3.2	50 57	2 28	3.2	49 58	2 23	3.1	48 58	2 18	3.0	268	272
89	91	53 59	1 23	1.7	52 59	1 20	1.7	51 59	1 17	1.6	50 59	1 14	1.6	49 59	1 11	1.6	48 59	1 09	1.5	269	271
90	90	54 00	0 00	0.0	53 00	0 00	0.0	52 00	0 00	0.0	51 00	0 00	0.0	50 00	0 00	0.0	49 00	0 00	0.0	270	270

Lat. N.: para AHL > 180°... $Z_n = Z$
para AHL < 180°... $Z_n = 360° - Z$

Lat. S.: para AHL > 180°... $Z_n = 180° - Z$
para AHL < 180°... $Z_n = 180° + Z$

B : (–) para 90° < AHL < 270°
Dec : (–) para la Lat. con signo contrario

TABLA PARA REDUCCION DE VISUALES

Z_1 : mismo signo que B
Z_2 : (–) para F > 90°

Lat. / A		42°			43°			44°			45°			46°			47°			Lat. / A	
AHL / F		A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	AHL	
°	°	° ′	° ′	°	° ′	° ′	°	° ′	° ′	°	° ′	° ′	°	° ′	° ′	°	° ′	° ′	°	°	°
0	180	0 00	48 00	90.0	0 00	47 00	90.0	0 00	46 00	90.0	0 00	45 00	90.0	0 00	44 00	90.0	0 00	43 00	90.0	180	360
1	179	0 45	48 00	89.3	0 44	47 00	89.3	0 43	46 00	89.3	0 42	45 00	89.3	0 42	44 00	89.3	0 41	43 00	89.3	181	359
2	178	1 29	47 59	88.7	1 28	46 59	88.6	1 26	45 59	88.6	1 25	44 59	88.6	1 23	43 59	88.6	1 22	42 59	88.5	182	358
3	177	2 14	47 58	88.0	2 12	46 58	88.0	2 09	45 58	87.9	2 07	44 58	87.9	2 05	43 58	87.8	2 03	42 58	87.8	183	357
4	176	2 58	47 56	87.3	2 55	46 56	87.3	2 53	45 56	87.2	2 50	44 56	87.2	2 47	43 56	87.1	2 44	42 56	87.1	184	356
5	175	3 43	47 53	86.6	3 39	46 53	86.6	3 36	45 53	86.5	3 32	44 53	86.5	3 28	43 53	86.4	3 24	42 53	86.3	185	355
6	174	4 27	47 51	86.0	4 23	46 51	85.9	4 19	45 51	85.8	4 14	44 51	85.7	4 10	43 51	85.7	4 05	42 51	85.6	186	354
7	173	5 12	47 47	85.3	5 07	46 47	85.2	5 02	45 47	85.1	4 57	44 47	85.0	4 51	43 47	85.0	4 46	42 47	84.9	187	353
8	172	5 56	47 43	84.6	5 51	46 43	84.5	5 45	45 43	84.4	5 39	44 43	84.3	5 33	43 43	84.2	5 27	42 43	84.1	188	352
9	171	6 41	47 39	84.0	6 34	46 39	83.8	6 28	45 39	83.7	6 21	44 39	83.6	6 14	43 39	83.5	6 07	42 39	83.4	189	351
10	170	7 25	47 34	83.3	7 18	46 34	83.1	7 11	45 34	83.0	7 03	44 34	82.9	6 56	43 34	82.8	6 48	42 34	82.7	190	350
11	169	8 09	47 28	82.6	8 01	46 28	82.4	7 53	45 28	82.3	7 45	44 28	82.2	7 37	43 28	82.0	7 29	42 28	81.9	191	349
12	168	8 53	47 22	81.9	8 45	46 22	81.8	8 36	45 22	81.6	8 27	44 22	81.5	8 18	43 22	81.3	8 09	42 22	81.2	192	348
13	167	9 37	47 16	81.2	9 28	46 15	81.1	9 19	45 15	80.9	9 09	44 15	80.7	8 59	43 15	80.6	8 49	42 16	80.4	193	347
14	166	10 21	47 08	80.5	10 11	46 08	80.3	10 01	45 08	80.2	9 51	44 08	80.0	9 40	43 08	79.8	9 30	42 08	79.7	194	346
15	165	11 05	47 01	79.8	10 55	46 00	79.6	10 44	45 00	79.5	10 33	44 00	79.3	10 21	43 00	79.1	10 10	42 01	78.9	195	345
16	164	11 49	46 52	79.1	11 38	45 52	78.9	11 26	44 52	78.7	11 14	43 52	78.5	11 02	42 52	78.3	10 50	41 52	78.2	196	344
17	163	12 33	46 43	78.4	12 21	45 43	78.2	12 08	44 43	78.0	11 56	43 43	77.8	11 43	42 43	77.6	11 30	41 44	77.4	197	343
18	162	13 17	46 34	77.7	13 04	45 34	77.5	12 51	44 34	77.3	12 37	43 34	77.1	12 24	42 34	76.8	12 10	41 34	76.6	198	342
19	161	14 00	46 24	77.0	13 46	45 24	76.8	13 33	44 24	76.5	13 19	43 24	76.3	13 04	42 24	76.1	12 50	41 24	75.9	199	341
20	160	14 43	46 13	76.3	14 29	45 13	76.1	14 15	44 13	75.8	14 00	43 13	75.6	13 45	42 13	75.3	13 29	41 14	75.1	200	340
21	159	15 27	46 02	75.6	15 12	45 02	75.3	14 56	44 02	75.1	14 41	43 02	74.8	14 25	42 02	74.6	14 09	41 03	74.3	201	339
22	158	16 10	45 50	74.9	15 54	44 50	74.6	15 38	43 50	74.3	15 22	42 50	74.1	15 05	41 50	73.8	14 48	40 51	73.5	202	338
23	157	16 53	45 38	74.1	16 36	44 38	73.9	16 19	43 38	73.6	16 02	42 38	73.3	15 45	41 38	73.0	15 27	40 39	72.8	203	337
24	156	17 36	45 25	73.4	17 18	44 25	73.1	17 01	43 25	72.8	16 43	42 25	72.5	16 25	41 25	72.2	16 06	40 26	72.0	204	336
25	155	18 18	45 11	72.7	18 00	44 11	72.4	17 42	43 11	72.1	17 23	42 11	71.8	17 04	41 12	71.5	16 45	40 12	71.2	205	335
26	154	19 01	44 57	71.9	18 42	43 57	71.6	18 23	42 57	71.3	18 03	41 57	71.0	17 44	40 57	70.7	17 24	39 58	70.4	206	334
27	153	19 43	44 42	71.2	19 24	43 42	70.8	19 04	42 42	70.5	18 43	41 42	70.2	18 23	40 43	69.9	18 02	39 43	69.6	207	333
28	152	20 25	44 26	70.4	20 05	43 26	70.1	19 44	42 26	69.7	19 23	41 27	69.4	19 02	40 27	69.1	18 40	39 28	68.8	208	332
29	151	21 07	44 10	69.6	20 46	43 10	69.3	20 25	42 10	68.9	20 03	41 10	68.6	19 41	40 11	68.3	19 18	39 12	67.9	209	331
30	150	21 49	43 53	68.9	21 27	42 53	68.5	21 05	41 53	68.1	20 42	40 54	67.8	20 19	39 54	67.4	19 56	38 55	67.1	210	330
31	149	22 30	43 35	68.1	22 08	42 35	67.7	21 45	41 36	67.3	21 21	40 36	67.0	20 58	39 37	66.6	20 34	38 38	66.3	211	329
32	143	23 11	43 17	67.3	22 48	42 17	66.9	22 24	41 17	66.5	22 00	40 18	66.2	21 36	39 19	65.8	21 11	38 20	65.4	212	328
33	147	23 53	42 58	66.5	23 28	41 58	66.1	23 04	40 58	65.7	22 39	39 59	65.3	22 14	39 00	65.0	21 48	38 02	64.6	213	327
34	146	24 33	42 38	65.7	24 08	41 38	65.3	23 43	40 39	64.9	23 17	39 40	64.5	22 51	38 41	64.1	22 25	37 42	63.7	214	326
35	145	25 14	42 18	64.9	24 48	41 18	64.5	24 22	40 18	64.1	23 56	39 19	63.7	23 29	38 21	63.3	23 02	37 23	62.9	215	325
36	144	25 54	41 56	64.1	25 28	40 57	63.6	25 01	39 57	63.2	24 34	38 58	62.8	24 06	38 00	62.4	23 38	37 02	62.0	216	324
37	143	26 34	41 34	63.2	26 07	40 35	62.8	25 39	39 35	62.4	25 11	38 37	61.9	24 43	37 38	61.5	24 14	36 41	61.1	217	323
38	142	27 14	41 11	62.4	26 46	40 12	61.9	26 17	39 13	61.5	25 48	38 14	61.1	25 19	37 16	60.7	24 50	36 19	60.3	218	322
39	141	27 53	40 48	61.5	27 24	39 48	61.1	26 55	38 50	60.6	26 25	37 51	60.2	25 55	36 53	59.8	25 25	35 56	59.4	219	321
40	140	28 32	40 23	60.7	28 02	39 24	60.2	27 32	38 25	59.8	27 02	37 27	59.3	26 31	36 30	58.9	26 00	35 32	58.5	220	320
41	139	29 11	39 58	59.8	28 40	38 59	59.3	28 10	38 01	58.9	27 38	37 03	58.4	27 07	36 05	58.0	26 35	35 08	57.6	221	319
42	138	29 49	39 32	58.9	29 18	38 33	58.4	28 46	37 35	58.0	28 14	36 37	57.5	27 42	35 40	57.1	27 09	34 43	56.6	222	318
43	137	30 27	39 05	58.0	29 55	38 06	57.5	29 23	37 08	57.1	28 50	36 11	56.6	28 17	35 14	56.1	27 43	34 18	55.7	223	317
44	136	31 05	38 37	57.1	30 32	37 39	56.6	29 59	36 41	56.1	29 25	35 44	55.7	28 51	34 47	55.2	28 17	33 51	54.8	224	316
45	135	31 42	38 09	56.2	31 08	37 10	55.7	30 34	36 13	55.2	30 00	35 16	54.7	29 25	34 20	54.3	28 50	33 24	53.8	225	315

Lat. / A		42°			43°			44°			45°			46°			47°			Lat. / A	
AHL / F		A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	AHL	
°	°	° ′	° ′	°	° ′	° ′	°	° ′	° ′	°	° ′	° ′	°	° ′	° ′	°	° ′	° ′	°	°	°
45	135	31 42	38 09	56.2	31 08	37 10	55.7	30 34	36 13	55.2	30 00	35 16	54.7	29 25	34 20	54.3	28 50	33 24	53.8	225	315
46	134	32 19	37 39	55.3	31 45	36 41	54.8	31 10	35 44	54.3	30 34	34 47	53.8	29 59	33 51	53.3	29 23	32 56	52.9	226	314
47	133	32 55	37 08	54.3	32 20	36 11	53.8	31 45	35 14	53.3	31 08	34 18	52.8	30 32	33 22	52.4	29 55	32 27	51.9	227	313
48	132	33 31	36 37	53.4	32 55	35 40	52.9	32 19	34 43	52.3	31 42	33 47	51.9	31 05	32 52	51.4	30 27	31 58	50.9	228	312
49	131	34 07	36 05	52.4	33 30	35 08	51.9	32 53	34 11	51.4	32 15	33 16	50.9	31 37	32 21	50.4	30 59	31 27	49.9	229	311
50	130	34 42	35 31	51.4	34 04	34 35	50.9	33 26	33 39	50.4	32 48	32 44	49.9	32 09	31 50	49.4	31 30	30 56	48.9	230	310
51	129	35 17	34 57	50.4	34 38	34 01	49.9	33 59	33 05	49.4	33 20	32 11	48.9	32 40	31 17	48.4	32 00	30 24	47.9	231	309
52	128	35 51	34 22	49.4	35 12	33 26	48.9	34 32	32 31	48.4	33 52	31 37	47.9	33 11	30 44	47.4	32 30	29 52	46.9	232	308
53	127	36 24	33 45	48.4	35 44	32 50	47.9	35 04	31 56	47.3	34 23	31 02	46.8	33 42	30 10	46.3	33 00	29 18	45.9	233	307
54	126	36 57	33 08	47.4	36 17	32 13	46.8	35 35	31 20	46.3	34 54	30 27	45.8	34 12	29 35	45.3	33 29	28 44	44.8	234	306
55	125	37 30	32 30	46.3	36 48	31 36	45.8	36 06	30 43	45.2	35 24	29 50	44.7	34 41	28 59	44.2	33 58	28 08	43.8	235	305
56	124	38 02	31 51	45.2	37 19	30 57	44.7	36 37	30 04	44.2	35 53	29 13	43.6	35 10	28 22	43.2	34 26	27 32	42.7	236	304
57	123	38 33	31 10	44.1	37 50	30 17	43.6	37 06	29 25	43.1	36 22	28 34	42.6	35 38	27 45	42.1	34 53	26 56	41.6	237	303
58	122	39 04	30 29	43.0	38 20	29 36	42.5	37 36	28 45	42.0	36 51	27 55	41.5	36 06	27 06	41.0	35 20	26 18	40.5	238	302
59	121	39 34	29 46	41.9	38 49	28 55	41.4	38 04	28 04	40.9	37 19	27 15	40.4	36 33	26 27	39.9	35 46	25 39	39.4	239	301
60	120	40 04	29 03	40.8	39 18	28 12	40.2	38 32	27 22	39.7	37 46	26 34	39.2	36 59	25 46	38.8	36 12	25 00	38.3	240	300
61	119	40 32	28 18	39.6	39 46	27 28	39.1	38 59	26 39	38.6	38 12	25 52	38.1	37 25	25 05	37.6	36 37	24 20	37.2	241	299
62	118	41 00	27 32	38.5	40 13	26 43	37.9	39 26	25 56	37.4	38 38	25 09	36.9	37 50	24 23	36.5	37 02	23 39	36.0	242	298
63	117	41 28	26 45	37.3	40 40	25 58	36.8	39 52	25 11	36.3	39 03	24 25	35.8	38 14	23 40	35.3	37 25	22 57	34.9	243	297
64	116	41 54	25 58	36.1	41 06	25 11	35.6	40 17	24 25	35.1	39 28	23 40	34.6	38 38	22 57	34.1	37 48	22 14	33.7	244	296
65	115	42 20	25 09	34.9	41 31	24 23	34.4	40 41	23 38	33.9	39 51	22 55	33.4	39 01	22 12	33.0	38 11	21 31	32.5	245	295
66	114	42 45	24 19	33.6	41 55	23 34	33.1	41 05	22 50	32.7	40 14	22 08	32.2	39 23	21 27	31.8	38 32	20 46	31.3	246	294
67	113	43 10	23 28	32.4	42 19	22 44	31.9	41 28	22 02	31.4	40 37	21 21	31.0	39 45	20 40	30.5	38 53	20 01	30.1	247	293
68	112	43 33	22 35	31.1	42 42	21 53	30.6	41 50	21 12	30.2	40 58	20 32	29.7	40 06	19 53	29.3	39 13	19 15	28.9	248	292
69	111	43 56	21 42	29.8	43 04	21 01	29.4	42 11	20 22	28.9	41 19	19 43	28.5	40 26	19 05	28.1	39 33	18 29	27.7	249	291
70	110	44 18	20 48	28.5	43 25	20 08	28.1	42 32	19 30	27.7	41 38	18 53	27.2	40 45	18 17	26.8	39 51	17 41	26.5	250	290
71	109	44 38	19 53	27.2	43 45	19 15	26.8	42 51	18 38	26.4	41 57	18 02	26.0	41 03	17 27	25.6	40 09	16 53	25.2	251	289
72	108	44 58	18 57	25.9	44 04	18 20	25.5	43 10	17 45	25.1	42 16	17 10	24.7	41 21	16 37	24.3	40 26	16 05	24.0	252	288
73	107	45 17	17 59	24.6	44 23	17 24	24.1	43 28	16 51	23.8	42 33	16 18	23.4	41 38	15 46	23.0	40 42	15 15	22.7	253	287
74	106	45 35	17 01	23.2	44 40	16 28	22.8	43 45	15 56	22.4	42 49	15 25	22.1	41 54	14 54	21.7	40 58	14 25	21.4	254	286
75	105	45 53	16 02	21.8	44 57	15 31	21.4	44 01	15 00	21.1	43 05	14 31	20.8	42 09	14 02	20.4	41 12	13 34	20.1	255	285
76	104	46 09	15 02	20.4	45 12	14 33	20.1	44 16	14 04	19.7	43 19	13 36	19.4	42 23	13 09	19.1	41 26	12 43	18.8	256	284
77	103	46 24	14 02	19.0	45 27	13 34	18.7	44 30	13 07	18.4	43 33	12 41	18.1	42 36	12 15	17.8	41 39	11 51	17.5	257	283
78	102	46 38	13 00	17.6	45 40	12 34	17.3	44 43	12 09	17.0	43 46	11 45	16.7	42 48	11 21	16.5	41 51	10 58	16.2	258	282
79	101	46 51	11 58	16.2	45 53	11 34	15.9	44 55	11 11	15.6	43 57	10 48	15.4	43 00	10 26	15.1	42 02	10 05	14.9	259	281
80	100	47 03	10 55	14.8	46 04	10 33	14.5	45 06	10 12	14.2	44 08	9 51	14.0	43 10	9 31	13.8	42 12	9 12	13.6	260	280
81	99	47 13	9 51	13.3	46 15	9 31	13.1	45 16	9 12	12.8	44 18	8 53	12.6	43 19	8 35	12.4	42 21	8 18	12.2	261	279
82	98	47 23	8 47	11.9	46 24	8 29	11.6	45 26	8 12	11.4	44 27	7 55	11.2	43 28	7 39	11.1	42 29	7 24	10.9	262	278
83	97	47 32	7 42	10.4	46 33	7 27	10.2	45 34	7 12	10.0	44 34	6 57	9.9	43 35	6 43	9.7	42 36	6 29	9.5	263	277
84	96	47 39	6 37	8.9	46 40	6 24	8.8	45 41	6 11	8.6	44 41	5 58	8.5	43 42	5 46	8.3	42 42	5 34	8.2	264	276
85	95	47 46	5 32	7.4	46 46	5 20	7.3	45 46	5 09	7.2	44 47	4 59	7.1	43 47	4 49	6.9	42 48	4 39	6.8	265	275
86	94	47 51	4 26	6.0	46 51	4 17	5.9	45 51	4 08	5.7	44 52	3 59	5.6	43 52	3 51	5.6	42 52	3 43	5.5	266	274
87	93	47 55	3 20	4.5	46 55	3 13	4.4	45 55	3 06	4.3	44 55	3 00	4.2	43 55	2 54	4.2	42 56	2 48	4.1	267	273
88	92	47 58	2 13	3.0	46 58	2 09	2.9	45 58	2 04	2.9	44 58	2 00	2.8	43 58	1 56	2.8	42 58	1 52	2.7	268	272
89	91	47 59	1 07	1.5	46 59	1 04	1.5	45 59	1 02	1.4	44 59	1 00	1.4	43 59	0 58	1.4	43 00	0 56	1.4	269	271
90	90	48 00	0 00	0.0	47 00	0 00	0.0	46 00	0 00	0.0	45 00	0 00	0.0	44 00	0 00	0.0	43 00	0 00	0.0	270	270

Lat. N.: para AHL > 180°... $Z_n = Z$
para AHL < 180°... $Z_n = 360° - Z$

Lat. S.: para AHL > 180°... $Z_n = 180° - Z$
para AHL < 180°... $Z_n = 180° + Z$

B : (–) para 90° < AHL < 270°
Dec : (–) para la Lat. con signo contrario

TABLA PARA REDUCCION DE VISUALES

Z_1 : mismo signo que B
Z_2 : (–) para F > 90°

Lat. / A		48°			49°			50°			51°			52°			53°			Lat. / A	
AHL / F		A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	AHL	
°	°	° ′	° ′	°	° ′	° ′	°	° ′	° ′	°	° ′	° ′	°	° ′	° ′	°	° ′	° ′	°	°	°
0	180	0 00	42 00	90.0	0 00	41 00	90.0	0 00	40 00	90.0	0 00	39 00	90.0	0 00	38 00	90.0	0 00	37 00	90.0	180	360
1	179	0 40	42 00	89.3	0 39	41 00	89.2	0 39	40 00	89.2	0 38	39 00	89.2	0 37	38 00	89.2	0 36	37 00	89.2	181	359
2	178	1 20	41 59	88.5	1 19	40 59	88.5	1 17	39 59	88.5	1 16	38 59	88.4	1 14	37 59	88.4	1 12	36 59	88.4	182	358
3	177	2 00	41 58	87.8	1 58	40 58	87.7	1 56	39 58	87.7	1 53	38 58	87.7	1 51	37 58	87.6	1 48	36 58	87.6	183	357
4	176	2 41	41 56	87.0	2 37	40 56	87.0	2 34	39 56	86.9	2 31	38 56	86.9	2 28	37 56	86.8	2 24	36 56	86.8	184	356
5	175	3 21	41 53	86.3	3 17	40 54	86.2	3 13	39 54	86.2	3 09	38 54	86.1	3 05	37 54	86.1	3 00	36 54	86.0	185	355
6	174	4 01	41 51	85.5	3 56	40 51	85.5	3 51	39 51	85.4	3 46	38 51	85.3	3 41	37 51	85.3	3 36	36 51	85.2	186	354
7	173	4 41	41 47	84.8	4 35	40 47	84.7	4 30	39 47	84.6	4 24	38 47	84.5	4 18	37 48	84.5	4 12	36 48	84.4	187	353
8	172	5 21	41 43	84.0	5 14	40 43	83.9	5 08	39 43	83.9	5 01	38 44	83.8	4 55	37 44	83.7	4 48	36 44	83.6	188	352
9	171	6 01	41 39	83.3	5 53	40 39	83.2	5 46	39 39	83.1	5 39	38 39	83.0	5 32	37 39	82.9	5 24	36 40	82.8	189	351
10	170	6 40	41 34	82.5	6 32	40 34	82.4	6 25	39 34	82.3	6 16	38 34	82.2	6 08	37 35	82.1	6 00	36 35	82.0	190	350
11	169	7 20	41 28	81.8	7 11	40 28	81.7	7 03	39 29	81.5	6 54	38 29	81.4	6 45	37 29	81.3	6 36	36 29	81.2	191	349
12	168	8 00	41 22	81.0	7 50	40 22	80.9	7 41	39 23	80.8	7 31	38 23	80.6	7 21	37 23	80.5	7 11	36 24	80.4	192	348
13	167	8 39	41 16	80.3	8 29	40 16	80.1	8 19	39 16	80.0	8 08	38 16	79.8	7 58	37 17	79.7	7 47	36 17	79.6	193	347
14	166	9 19	41 09	79.5	9 08	40 09	79.3	8 57	39 09	79.2	8 45	38 09	79.0	8 34	37 10	78.9	8 22	36 10	78.7	194	346
15	165	9 58	41 01	78.7	9 47	40 01	78.6	9 35	39 02	78.4	9 22	38 02	78.2	9 10	37 02	78.1	8 58	36 03	77.9	195	345
16	164	10 38	40 53	78.0	10 25	39 53	77.8	10 12	38 53	77.6	9 59	37 54	77.4	9 46	36 54	77.3	9 33	35 55	77.1	196	344
17	163	11 17	40 44	77.2	11 04	39 44	77.0	10 50	38 45	76.8	10 36	37 45	76.6	10 22	36 46	76.5	10 08	35 47	76.3	197	343
18	162	11 56	40 34	76.4	11 42	39 35	76.2	11 27	38 35	76.0	11 13	37 36	75.8	10 58	36 37	75.6	10 43	35 38	75.5	198	342
19	161	12 35	40 25	75.6	12 20	39 25	75.4	12 05	38 26	75.2	11 49	37 26	75.0	11 34	36 27	74.8	11 18	35 28	74.6	199	341
20	160	13 14	40 14	74.9	12 58	39 15	74.6	12 42	38 15	74.4	12 26	37 16	74.2	12 09	36 17	74.0	11 53	35 18	73.8	200	340
21	159	13 52	40 03	74.1	13 36	39 04	73.8	13 19	38 04	73.6	13 02	37 05	73.4	12 45	36 06	73.2	12 27	35 08	73.0	201	339
22	158	14 31	39 51	73.3	14 14	38 52	73.0	13 56	37 53	72.8	13 38	36 54	72.6	13 20	35 55	72.3	13 02	34 56	72.1	202	338
23	157	15 09	39 39	72.5	14 51	38 40	72.2	14 33	37 41	72.0	14 14	36 42	71.7	13 55	35 43	71.5	13 36	34 45	71.3	203	337
24	156	15 48	39 26	71.7	15 29	38 27	71.4	15 09	37 28	71.2	14 50	36 30	70.9	14 30	35 31	70.7	14 10	34 33	70.4	204	336
25	155	16 26	39 13	70.9	16 06	38 14	70.6	15 46	37 15	70.3	15 25	36 17	70.1	15 05	35 18	69.8	14 44	34 20	69.6	205	335
26	154	17 03	38 59	70.1	16 43	38 00	69.8	16 22	37 01	69.5	16 01	36 03	69.2	15 39	35 05	69.0	15 18	34 07	68.7	206	334
27	153	17 41	38 44	69.3	17 20	37 46	69.0	16 58	36 47	68.7	16 36	35 49	68.4	16 14	34 51	68.1	15 51	33 53	67.9	207	333
28	152	18 19	38 29	68.4	17 56	37 30	68.1	17 34	36 32	67.8	17 11	35 34	67.5	16 48	34 36	67.3	16 25	33 38	67.0	208	332
29	151	18 56	38 13	67.6	18 33	37 15	67.3	18 09	36 16	67.0	17 46	35 18	66.7	17 22	34 21	66.4	16 58	33 23	66.1	209	331
30	150	19 33	37 57	66.8	19 09	36 58	66.5	18 45	36 00	66.1	18 20	35 03	65.8	17 56	34 05	65.5	17 31	33 08	65.2	210	330
31	149	20 10	37 40	65.9	19 45	36 41	65.6	19 20	35 44	65.3	18 55	34 46	65.0	18 29	33 49	64.7	18 03	32 52	64.4	211	329
32	148	20 46	37 22	65.1	20 21	36 24	64.8	19 55	35 26	64.4	19 29	34 29	64.1	19 02	33 32	63.8	18 36	32 35	63.5	212	328
33	147	21 22	37 03	64.2	20 56	36 06	63.9	20 30	35 08	63.6	20 03	34 11	63.2	19 35	33 14	62.9	19 08	32 18	62.6	213	327
34	146	21 58	36 44	63.4	21 31	35 47	63.0	21 04	34 49	62.7	20 36	33 53	62.3	20 08	32 56	62.0	19 40	32 00	61.7	214	326
35	145	22 34	36 25	62.5	22 06	35 27	62.1	21 38	34 30	61.8	21 10	33 33	61.4	20 41	32 37	61.1	20 12	31 41	60.8	215	325
36	144	23 10	36 04	61.6	22 41	35 07	61.3	22 12	34 10	60.9	21 43	33 14	60.5	21 13	32 18	60.2	20 43	31 22	59.9	216	324
37	143	23 45	35 43	60.8	23 15	34 46	60.4	22 45	33 50	60.0	22 15	32 54	59.6	21 45	31 58	59.3	21 14	31 02	59.0	217	323
38	142	24 20	35 21	59.9	23 49	34 25	59.5	23 19	33 28	59.1	22 48	32 33	58.7	22 16	31 37	58.4	21 45	30 42	58.0	218	322
39	141	24 54	34 59	59.0	24 23	34 02	58.6	23 52	33 07	58.2	23 20	32 11	57.8	22 48	31 16	57.5	22 15	30 21	57.1	219	321
40	140	25 28	34 36	58.1	24 57	33 40	57.7	24 24	32 44	57.3	23 52	31 49	56.9	23 19	30 54	56.5	22 45	30 00	56.2	220	320
41	139	26 02	34 12	57.1	25 30	33 16	56.7	24 57	32 21	56.3	24 23	31 26	56.0	23 49	30 32	55.6	23 15	29 38	55.2	221	319
42	138	26 36	33 47	56.2	26 02	32 52	55.8	25 28	31 57	55.4	24 54	31 02	55.0	24 20	30 08	54.6	23 45	29 15	54.3	222	318
43	137	27 09	33 22	55.3	26 35	32 27	54.9	26 00	31 32	54.5	25 25	30 38	54.1	24 50	29 45	53.7	24 14	28 52	53.3	223	317
44	136	27 42	32 56	54.3	27 07	32 01	53.9	26 31	31 07	53.5	25 55	30 13	53.1	25 19	29 20	52.7	24 43	28 28	52.4	224	316
45	135	28 14	32 29	53.4	27 38	31 35	53.0	27 02	30 41	52.5	26 25	29 48	52.1	25 48	28 55	51.8	25 11	28 03	51.4	225	315

Lat. / A		48°			49°			50°			51°			52°			53°			Lat. / A	
AHL / F		A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	AHL	
°	°	° ′	° ′	°	° ′	° ′	°	° ′	° ′	°	° ′	° ′	°	° ′	° ′	°	° ′	° ′	°	°	°
45	135	28 14	32 29	53.4	27 38	31 35	53.0	27 02	30 41	52.5	26 25	29 48	52.1	25 48	28 55	51.8	25 11	28 03	51.4	225	315
46	134	28 46	32 01	52.4	28 10	31 08	52.0	27 32	30 14	51.6	26 55	29 22	51.2	26 17	28 29	50.8	25 39	27 38	50.4	226	314
47	133	29 18	31 33	51.4	28 40	30 40	51.0	28 02	29 47	50.6	27 24	28 55	50.2	26 46	28 03	49.8	26 07	27 12	49.4	227	313
48	132	29 49	31 04	50.5	29 11	30 11	50.0	28 32	29 19	49.6	27 53	28 27	49.2	27 14	27 36	48.8	26 34	26 46	48.4	228	312
49	131	30 20	30 34	49.5	29 41	29 42	49.0	29 01	28 50	48.6	28 21	27 59	48.2	27 41	27 08	47.8	27 01	26 18	47.4	229	311
50	130	30 50	30 04	48.5	30 10	29 12	48.0	29 30	28 20	47.6	28 49	27 30	47.2	28 08	26 40	46.8	27 27	25 51	46.4	230	310
51	129	31 20	29 32	47.5	30 39	28 41	47.0	29 58	27 50	46.6	29 17	27 00	46.2	28 35	26 11	45.8	27 53	25 22	45.4	231	309
52	128	31 49	29 00	46.4	31 08	28 09	46.0	30 26	27 19	45.6	29 44	26 30	45.2	29 01	25 41	44.8	28 19	24 53	44.4	232	308
53	127	32 18	28 27	45.4	31 36	27 37	45.0	30 53	26 48	44.5	30 10	25 59	44.1	29 27	25 11	43.7	28 44	24 24	43.3	233	307
54	126	32 46	27 53	44.4	32 03	27 04	43.9	31 20	26 15	43.5	30 36	25 27	43.1	29 52	24 40	42.7	29 08	23 53	42.3	234	306
55	125	33 14	27 19	43.3	32 30	26 30	42.9	31 46	25 42	42.4	31 02	24 55	42.0	30 17	24 08	41.6	29 32	23 23	41.2	235	305
56	124	33 42	26 44	42.2	32 57	25 55	41.8	32 12	25 08	41.4	31 27	24 22	41.0	30 41	23 36	40.6	29 56	22 51	40.2	236	304
57	123	34 08	26 07	41.1	33 23	25 20	40.7	32 37	24 34	40.3	31 51	23 48	39.9	31 05	23 03	39.5	30 19	22 19	39.1	237	303
58	122	34 34	25 30	40.1	33 48	24 44	39.6	33 02	23 58	39.2	32 15	23 14	38.8	31 28	22 29	38.4	30 41	21 46	38.0	238	302
59	121	35 00	24 53	39.0	34 13	24 07	38.5	33 26	23 22	38.1	32 39	22 38	37.7	31 51	21 55	37.3	31 03	21 13	37.0	239	301
60	120	35 25	24 14	37.8	34 37	23 30	37.4	33 50	22 46	37.0	33 02	22 03	36.6	32 13	21 20	36.2	31 25	20 39	35.9	240	300
61	119	35 49	23 35	36.7	35 01	22 51	36.3	34 12	22 08	35.9	33 24	21 26	35.5	32 35	20 45	35.1	31 46	20 04	34.8	241	299
62	118	36 13	22 55	35.6	35 24	22 12	35.2	34 35	21 30	34.8	33 45	20 49	34.4	32 56	20 09	34.0	32 06	19 29	33.7	242	298
63	117	36 36	22 14	34.4	35 46	21 32	34.0	34 56	20 51	33.6	34 06	20 11	33.3	33 16	19 32	32.9	32 26	18 53	32.5	243	297
64	116	36 58	21 32	33.3	36 08	20 52	32.9	35 17	20 12	32.5	34 27	19 33	32.1	33 36	18 54	31.8	32 45	18 17	31.4	244	296
65	115	37 20	20 50	32.1	36 29	20 10	31.7	35 38	19 32	31.3	34 47	18 54	31.0	33 55	18 16	30.6	33 03	17 40	30.3	245	295
66	114	37 41	20 07	30.9	36 49	19 28	30.5	35 58	18 51	30.2	35 06	18 14	29.8	34 13	17 38	29.5	33 21	17 02	29.1	246	294
67	113	38 01	19 23	29.7	37 09	18 46	29.4	36 17	18 09	29.0	35 24	17 33	28.6	34 31	16 59	28.3	33 38	16 24	28.0	247	293
68	112	38 21	18 38	28.5	37 28	18 02	28.2	36 35	17 27	27.8	35 42	16 53	27.5	34 48	16 19	27.1	33 55	15 46	26.8	248	292
69	111	38 40	17 53	27.3	37 46	17 18	27.0	36 53	16 44	26.6	35 59	16 11	26.3	35 05	15 38	26.0	34 11	15 07	25.7	249	291
70	110	38 58	17 07	26.1	38 04	16 33	25.7	37 10	16 01	25.4	36 15	15 29	25.1	35 21	14 58	24.8	34 26	14 27	24.5	250	290
71	109	39 15	16 20	24.9	38 20	15 48	24.5	37 26	15 17	24.2	36 31	14 46	23.9	35 36	14 16	23.6	34 41	13 47	23.3	251	289
72	108	39 31	15 33	23.6	38 36	15 02	23.3	37 41	14 32	23.0	36 46	14 03	22.7	35 50	13 34	22.4	34 55	13 07	22.1	252	288
73	107	39 47	14 45	22.4	38 51	14 16	22.1	37 56	13 47	21.8	37 00	13 19	21.5	36 04	12 52	21.2	35 08	12 25	20.9	253	287
74	106	40 02	13 56	21.1	39 06	13 28	20.8	38 10	13 01	20.5	37 13	12 35	20.3	36 17	12 09	20.0	35 21	11 44	19.8	254	286
75	105	40 16	13 07	19.8	39 19	12 41	19.5	38 23	12 15	19.3	37 26	11 50	19.0	36 29	11 26	18.8	35 33	11 02	18.5	255	285
76	104	40 29	12 17	18.5	39 32	11 53	18.3	38 35	11 28	18.0	37 38	11 05	17.8	36 41	10 42	17.6	35 44	10 20	17.3	256	284
77	103	40 41	11 27	17.3	39 44	11 04	17.0	38 47	10 41	16.8	37 49	10 19	16.5	36 52	9 58	16.3	35 54	9 37	16.1	257	283
78	102	40 53	10 36	16.0	39 55	10 15	15.7	38 57	9 54	15.5	38 00	9 33	15.3	37 02	9 14	15.1	36 04	8 54	14.9	258	282
79	101	41 04	9 45	14.7	40 05	9 25	14.4	39 07	9 06	14.2	38 09	8 47	14.0	37 11	8 29	13.9	36 13	8 11	13.7	259	281
80	100	41 13	8 53	13.3	40 15	8 35	13.2	39 16	8 17	13.0	38 18	8 00	12.8	37 19	7 44	12.6	36 21	7 27	12.5	260	280
81	99	41 22	8 01	12.0	40 23	7 45	11.9	39 25	7 29	11.7	38 26	7 13	11.5	37 27	6 58	11.4	36 28	6 43	11.2	261	279
82	98	41 30	7 09	10.7	40 31	6 54	10.5	39 32	6 40	10.4	38 33	6 26	10.3	37 34	6 12	10.1	36 35	5 59	10.0	262	278
83	97	41 37	6 16	9.4	40 38	6 03	9.2	39 39	5 50	9.1	38 39	5 38	9.0	37 40	5 26	8.9	36 41	5 15	8.7	263	277
84	96	41 43	5 23	8.1	40 44	5 12	7.9	39 44	5 01	7.8	38 45	4 50	7.7	37 45	4 40	7.6	36 46	4 30	7.5	264	276
85	95	41 48	4 29	6.7	40 49	4 20	6.6	39 49	4 11	6.5	38 49	4 02	6.4	37 50	3 54	6.3	36 50	3 45	6.3	265	275
86	94	41 52	3 36	5.4	40 53	3 28	5.3	39 53	3 21	5.2	38 53	3 14	5.1	37 53	3 07	5.1	36 54	3 01	5.0	266	274
87	93	41 56	2 42	4.0	40 56	2 36	4.0	39 56	2 31	3.9	38 56	2 26	3.9	37 56	2 20	3.8	36 56	2 16	3.8	267	273
88	92	41 58	1 48	2.7	40 58	1 44	2.6	39 58	1 41	2.6	38 58	1 37	2.6	37 58	1 34	2.5	36 58	1 30	2.5	268	272
89	91	42 00	0 54	1.3	41 00	0 52	1.3	40 00	0 50	1.3	39 00	0 49	1.3	38 00	0 47	1.3	37 00	0 45	1.3	269	271
90	90	42 00	0 00	0.0	41 00	0 00	0.0	40 00	0 00	0.0	39 00	0 00	0.0	38 00	0 00	0.0	37 00	0 00	0.0	270	270

Lat. N.: para AHL > 180°... $Z_n = Z$
para AHL < 180°... $Z_n = 360° - Z$

Lat. S.: para AHL > 180°... $Z_n = 180° - Z$
para AHL < 180°... $Z_n = 180° + Z$

B : (–) para 90° < AHL < 270°
Dec : (–) para la Lat. con signo contrario

TABLA PARA REDUCCION DE VISUALES

Z_1 : mismo signo que B
Z_2 : (–) para F > 90°

Lat. / A		54°			55°			56°			57°			58°			59°			Lat. / A	
AHL / F		A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	AHL	
°	°	° ′	° ′	°	° ′	° ′	°	° ′	° ′	°	° ′	° ′	°	° ′	° ′	°	° ′	° ′	°	°	°
0	180	0 00	36 00	90.0	0 00	35 00	90.0	0 00	34 00	90.0	0 00	33 00	90.0	0 00	32 00	90.0	0 00	31 00	90.0	180	360
1	179	0 35	36 00	89.2	0 34	35 00	89.2	0 34	34 00	89.2	0 33	33 00	89.2	0 32	32 00	89.2	0 31	31 00	89.1	181	359
2	178	1 11	35 59	88.4	1 09	34 59	88.4	1 07	33 59	88.3	1 05	32 59	88.3	1 04	31 59	88.3	1 02	30 59	88.3	182	358
3	177	1 46	35 58	87.6	1 43	34 58	87.5	1 41	33 58	87.5	1 38	32 58	87.5	1 35	31 58	87.5	1 33	30 58	87.4	183	357
4	176	2 21	35 56	86.8	2 18	34 56	86.7	2 14	33 56	86.7	2 11	32 56	86.6	2 07	31 56	86.6	2 04	30 56	86.6	184	356
5	175	2 56	35 54	86.0	2 52	34 54	85.9	2 48	33 54	85.9	2 43	32 54	85.8	2 39	31 54	85.8	2 34	30 54	85.7	185	355
6	174	3 31	35 51	85.1	3 26	34 51	85.1	3 21	33 51	85.0	3 16	32 51	85.0	3 11	31 52	84.9	3 05	30 52	84.9	186	354
7	173	4 06	35 48	84.3	4 00	34 48	84.3	3 54	33 48	84.2	3 48	32 48	84.1	3 42	31 48	84.1	3 36	30 49	84.0	187	353
8	172	4 42	35 44	83.5	4 35	34 44	83.4	4 28	33 44	83.4	4 21	32 45	83.3	4 14	31 45	83.2	4 07	30 45	83.1	188	352
9	171	5 17	35 40	82.7	5 09	34 40	82.6	5 01	33 40	82.5	4 53	32 41	82.4	4 45	31 41	82.3	4 37	30 41	82.3	189	351
10	170	5 51	35 35	81.9	5 43	34 35	81.8	5 34	33 36	81.7	5 26	32 36	81.6	5 17	31 36	81.5	5 08	30 37	81.4	190	350
11	169	6 26	35 30	81.1	6 17	34 30	81.0	6 08	33 31	80.8	5 58	32 31	80.7	5 48	31 31	80.6	5 38	30 32	80.5	191	349
12	168	7 01	35 24	80.2	6 51	34 24	80.1	6 41	33 25	80.0	6 30	32 25	79.9	6 20	31 26	79.8	6 09	30 27	79.7	192	348
13	167	7 36	35 18	79.4	7 25	34 18	79.3	7 14	33 19	79.2	7 02	32 19	79.0	6 51	31 20	78.9	6 39	30 21	78.8	193	347
14	166	8 11	35 11	78.6	7 59	34 12	78.5	7 46	33 12	78.3	7 34	32 13	78.2	7 22	31 14	78.1	7 09	30 15	77.9	194	346
15	165	8 45	35 04	77.8	8 32	34 04	77.6	8 19	33 05	77.5	8 06	32 06	77.3	7 53	31 07	77.2	7 40	30 08	77.1	195	345
16	164	9 19	34 56	76.9	9 06	33 57	76.8	8 52	32 58	76.6	8 38	31 58	76.5	8 24	31 00	76.3	8 10	30 01	76.2	196	344
17	163	9 54	34 47	76.1	9 39	33 48	75.9	9 25	32 49	75.8	9 10	31 50	75.6	8 55	30 52	75.5	8 40	29 53	75.3	197	343
18	162	10 28	34 39	75.3	10 13	33 40	75.1	9 57	32 41	74.9	9 41	31 42	74.8	9 25	30 43	74.6	9 09	29 45	74.4	198	342
19	161	11 02	34 29	74.4	10 46	33 30	74.2	10 29	32 32	74.1	10 13	31 33	73.9	9 56	30 35	73.7	9 39	29 36	73.6	199	341
20	160	11 36	34 19	73.6	11 19	33 21	73.4	11 02	32 22	73.2	10 44	31 24	73.0	10 27	30 25	72.8	10 09	29 27	72.7	200	340
21	159	12 10	34 09	72.7	11 52	33 10	72.5	11 34	32 12	72.3	11 15	31 14	72.2	10 57	30 15	72.0	10 38	29 17	71.8	201	339
22	158	12 43	33 58	71.9	12 24	33 00	71.7	12 06	32 01	71.5	11 46	31 03	71.3	11 27	30 05	71.1	11 07	29 07	70.9	202	338
23	157	13 17	33 46	71.0	12 57	32 48	70.8	12 37	31 50	70.6	12 17	30 52	70.4	11 57	29 54	70.2	11 37	28 57	70.0	203	337
24	156	13 50	33 34	70.2	13 29	32 36	70.0	13 09	31 38	69.7	12 48	30 41	69.5	12 27	29 43	69.3	12 06	28 46	69.1	204	336
25	155	14 23	33 22	69.3	14 02	32 24	69.1	13 40	31 26	68.9	13 18	30 29	68.6	12 56	29 31	68.4	12 34	28 34	68.2	205	335
26	154	14 56	33 09	68.5	14 34	32 11	68.2	14 11	31 14	68.0	13 49	30 16	67.8	13 26	29 19	67.5	13 03	28 22	67.3	206	334
27	153	15 29	32 55	67.6	15 06	31 58	67.3	14 42	31 00	67.1	14 19	30 03	66.9	13 55	29 06	66.6	13 31	28 10	66.4	207	333
28	152	16 01	32 41	66.7	15 37	31 44	66.5	15 13	30 47	66.2	14 49	29 50	66.0	14 24	28 53	65.7	14 00	27 57	65.5	208	332
29	151	16 33	32 26	65.8	16 09	31 29	65.6	15 44	30 32	65.3	15 19	29 36	65.1	14 53	28 39	64.8	14 28	27 43	64.6	209	331
30	150	17 05	32 11	65.0	16 40	31 14	64.7	16 14	30 17	64.4	15 48	29 21	64.2	15 22	28 25	63.9	14 55	27 29	63.7	210	330
31	149	17 37	31 55	64.1	17 11	30 58	63.8	16 44	30 02	63.5	16 17	29 06	63.3	15 50	28 10	63.0	15 23	27 15	62.7	211	329
32	148	18 09	31 38	63.2	17 42	30 42	62.9	17 14	29 46	62.6	16 47	28 51	62.3	16 19	27 55	62.1	15 50	27 00	61.8	212	328
33	147	18 40	31 21	62.3	18 12	30 25	62.0	17 44	29 30	61.7	17 15	28 34	61.4	16 47	27 39	61.2	16 17	26 45	60.9	213	327
34	146	19 11	31 04	61.4	18 42	30 08	61.1	18 13	29 13	60.8	17 44	28 18	60.5	17 14	27 23	60.2	16 44	26 29	60.0	214	326
35	145	19 42	30 46	60.5	19 12	29 50	60.2	18 42	28 55	59.9	18 12	28 01	59.6	17 42	27 06	59.3	17 11	26 12	59.0	215	325
36	144	20 13	30 27	59.6	19 42	29 32	59.2	19 11	28 37	58.9	18 40	27 43	58.6	18 09	26 49	58.4	17 37	25 55	58.1	216	324
37	143	20 43	30 07	58.6	20 12	29 13	58.3	19 40	28 19	58.0	19 08	27 25	57.7	18 36	26 31	57.4	18 03	25 38	57.1	217	323
38	142	21 13	29 48	57.7	20 41	28 53	57.4	20 08	27 59	57.1	19 35	27 06	56.8	19 02	26 13	56.5	18 29	25 20	56.2	218	322
39	141	21 43	29 27	56.8	21 10	28 33	56.4	20 36	27 40	56.1	20 03	26 47	55.8	19 29	25 54	55.5	18 55	25 02	55.2	219	321
40	140	22 12	29 06	55.8	21 38	28 13	55.5	21 04	27 20	55.2	20 30	26 27	54.9	19 55	25 35	54.6	19 20	24 43	54.3	220	320
41	139	22 41	28 44	54.9	22 06	27 51	54.5	21 31	26 59	54.2	20 56	26 07	53.9	20 21	25 15	53.6	19 45	24 24	53.3	221	319
42	138	23 10	28 22	53.9	22 34	27 29	53.6	21 58	26 37	53.3	21 22	25 46	52.9	20 46	24 55	52.6	20 10	24 04	52.3	222	318
43	137	23 38	27 59	53.0	23 02	27 07	52.6	22 25	26 15	52.3	21 48	25 24	52.0	21 11	24 34	51.7	20 34	23 43	51.4	223	317
44	136	24 06	27 36	52.0	23 29	26 44	51.7	22 51	25 53	51.3	22 14	25 02	51.0	21 36	24 12	50.7	20 58	23 23	50.4	224	316
45	135	24 34	27 11	51.0	23 56	26 20	50.7	23 17	25 30	50.3	22 39	24 40	50.0	22 00	23 50	49.7	21 21	23 01	49.4	225	315

Lat. / A		54°			55°			56°			57°			58°			59°			Lat. / A	
AHL / F		A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	AHL	
°	°	° ′	° ′	°	° ′	° ′	°	° ′	° ′	°	° ′	° ′	°	° ′	° ′	°	° ′	° ′	°	°	°
45	135	24 34	27 11	51.0	23 56	26 20	50.7	23 17	25 30	50.3	22 39	24 40	50.0	22 00	23 50	49.7	21 21	23 01	49.4	225	315
46	134	25 01	26 47	50.0	24 22	25 56	49.7	23 43	25 06	49.4	23 04	24 17	49.0	22 24	23 28	48.7	21 45	22 39	48.4	226	314
47	133	25 28	26 22	49.1	24 48	25 32	48.7	24 08	24 42	48.4	23 28	23 53	48.0	22 48	23 05	47.7	22 08	22 17	47.4	227	313
48	132	25 54	25 56	48.1	25 14	25 06	47.7	24 33	24 17	47.4	23 53	23 29	47.0	23 11	22 41	46.7	22 30	21 54	46.4	228	312
49	131	26 20	25 29	47.1	25 39	24 40	46.7	24 58	23 52	46.4	24 16	23 05	46.0	23 34	22 17	45.7	22 52	21 31	45.4	229	311
50	130	26 46	25 02	46.0	26 04	24 14	45.7	25 22	23 26	45.3	24 40	22 39	45.0	23 57	21 53	44.7	23 14	21 07	44.4	230	310
51	129	27 11	24 34	45.0	26 28	23 47	44.7	25 45	23 00	44.3	25 02	22 14	44.0	24 19	21 28	43.7	23 36	20 43	43.4	231	309
52	128	27 36	24 06	44.0	26 52	23 19	43.6	26 09	22 33	43.3	25 25	21 48	43.0	24 41	21 03	42.7	23 57	20 18	42.3	232	308
53	127	28 00	23 37	43.0	27 16	22 51	42.6	26 32	22 06	42.3	25 47	21 21	41.9	25 02	20 37	41.6	24 17	19 53	41.3	233	307
54	126	28 24	23 07	41.9	27 39	22 22	41.6	26 54	21 38	41.2	26 09	20 54	40.9	25 23	20 10	40.6	24 37	19 27	40.3	234	306
55	125	28 47	22 37	40.9	28 01	21 53	40.5	27 16	21 09	40.2	26 30	20 26	39.9	25 44	19 43	39.5	24 57	19 01	39.2	235	305
56	124	29 10	22 07	39.8	28 24	21 23	39.5	27 37	20 40	39.1	26 50	19 57	38.8	26 04	19 16	38.5	25 17	18 34	38.2	236	304
57	123	29 32	21 35	38.8	28 45	20 52	38.4	27 58	20 10	38.1	27 11	19 29	37.8	26 23	18 48	37.4	25 35	18 07	37.1	237	303
58	122	29 54	21 03	37.7	29 06	20 21	37.3	28 19	19 40	37.0	27 31	18 59	36.7	26 42	18 19	36.4	25 54	17 40	36.1	238	302
59	121	30 15	20 31	36.6	29 27	19 50	36.3	28 38	19 09	35.9	27 50	18 30	35.6	27 01	17 50	35.3	26 12	17 12	35.0	239	301
60	120	30 36	19 58	35.5	29 47	19 18	35.2	28 58	18 38	34.9	28 09	17 59	34.5	27 19	17 21	34.2	26 29	16 43	34.0	240	300
61	119	30 56	19 24	34.4	30 07	18 45	34.1	29 17	18 06	33.8	28 27	17 29	33.5	27 37	16 51	33.2	26 46	16 14	32.9	241	299
62	118	31 16	18 50	33.3	30 26	18 12	33.0	29 35	17 34	32.7	28 45	16 57	32.4	27 54	16 21	32.1	27 03	15 45	31.8	242	298
63	117	31 35	18 15	32.2	30 44	17 38	31.9	29 53	17 02	31.6	29 02	16 26	31.3	28 10	15 50	31.0	27 19	15 15	30.7	243	297
64	116	31 53	17 40	31.1	31 02	17 04	30.8	30 10	16 28	30.5	29 19	15 53	30.2	28 27	15 19	29.9	27 35	14 45	29.6	244	296
65	115	32 11	17 04	30.0	31 19	16 29	29.7	30 27	15 55	29.4	29 35	15 21	29.1	28 42	14 48	28.8	27 50	14 15	28.5	245	295
66	114	32 29	16 28	28.8	31 36	15 54	28.5	30 43	15 20	28.2	29 50	14 48	28.0	28 57	14 16	27.7	28 04	13 44	27.4	246	294
67	113	32 45	15 51	27.7	31 52	15 18	27.4	30 59	14 46	27.1	30 05	14 14	26.8	29 12	13 43	26.6	28 18	13 13	26.3	247	293
68	112	33 01	15 14	26.5	32 08	14 42	26.3	31 14	14 11	26.0	30 20	13 40	25.7	29 26	13 10	25.5	28 31	12 41	25.2	248	292
69	111	33 17	14 36	25.4	32 23	14 05	25.1	31 28	13 35	24.8	30 34	13 06	24.6	29 39	12 37	24.4	28 44	12 09	24.1	249	291
70	110	33 32	13 57	24.2	32 37	13 28	24.0	31 42	12 59	23.7	30 47	12 31	23.5	29 52	12 04	23.2	28 57	11 37	23.0	250	290
71	109	33 46	13 18	23.1	32 51	12 51	22.8	31 55	12 23	22.6	31 00	11 56	22.3	30 04	11 30	22.1	29 09	11 04	21.9	251	289
72	108	33 59	12 39	21.9	33 04	12 13	21.6	32 08	11 46	21.4	31 12	11 21	21.2	30 16	10 56	21.0	29 20	10 31	20.8	252	288
73	107	34 12	12 00	20.7	33 16	11 34	20.5	32 20	11 09	20.2	31 23	10 45	20.0	30 27	10 21	19.8	29 30	9 58	19.6	253	287
74	106	34 24	11 19	19.5	33 28	10 55	19.3	32 31	10 32	19.1	31 34	10 09	18.9	30 37	9 46	18.7	29 41	9 24	18.5	254	286
75	105	34 36	10 39	18.3	33 39	10 16	18.1	32 42	9 54	17.9	31 44	9 32	17.7	30 47	9 11	17.5	29 50	8 50	17.4	255	285
76	104	34 46	9 58	17.1	33 49	9 37	16.9	32 52	9 16	16.7	31 54	8 56	16.6	30 57	8 36	16.4	29 59	8 16	16.2	256	284
77	103	34 56	9 17	15.9	33 59	8 57	15.7	33 01	8 38	15.6	32 03	8 19	15.4	31 05	8 00	15.2	30 07	7 42	15.1	257	283
78	102	35 06	8 35	14.7	34 08	8 17	14.5	33 10	7 59	14.4	32 11	7 41	14.2	31 13	7 24	14.1	30 15	7 07	13.9	258	282
79	101	35 14	7 54	13.5	34 16	7 37	13.3	33 18	7 20	13.2	32 19	7 04	13.0	31 21	6 48	12.9	30 22	6 32	12.8	259	281
80	100	35 22	7 11	12.3	34 24	6 56	12.1	33 25	6 41	12.0	32 26	6 26	11.9	31 27	6 12	11.7	30 29	5 57	11.6	260	280
81	99	35 29	6 29	11.1	34 30	6 15	10.9	33 32	6 01	10.8	32 33	5 48	10.7	31 34	5 35	10.6	30 35	5 22	10.5	261	279
82	98	35 36	5 46	9.9	34 37	5 34	9.7	33 37	5 22	9.6	32 38	5 10	9.5	31 39	4 58	9.4	30 40	4 47	9.3	262	278
83	97	35 41	5 04	8.6	34 42	4 53	8.5	33 43	4 42	8.4	32 43	4 32	8.3	31 44	4 21	8.2	30 45	4 11	8.2	263	277
84	96	35 46	4 21	7.4	34 47	4 11	7.3	33 47	4 02	7.2	32 48	3 53	7.1	31 48	3 44	7.1	30 49	3 36	7.0	264	276
85	95	35 51	3 37	6.2	34 51	3 30	6.1	33 51	3 22	6.0	32 52	3 14	6.0	31 52	3 07	5.9	30 52	3 00	5.8	265	275
86	94	35 54	2 54	4.9	34 54	2 48	4.9	33 54	2 42	4.8	32 55	2 36	4.8	31 55	2 30	4.7	30 55	2 24	4.7	266	274
87	93	35 57	2 11	3.7	34 57	2 06	3.7	33 57	2 01	3.6	32 57	1 57	3.6	31 57	1 52	3.5	30 57	1 48	3.5	267	273
88	92	35 58	1 27	2.5	34 59	1 24	2.4	33 59	1 21	2.4	32 59	1 18	2.4	31 59	1 15	2.4	30 59	1 12	2.3	268	272
89	91	36 00	0 44	1.2	35 00	0 42	1.2	34 00	0 40	1.2	33 00	0 39	1.2	32 00	0 37	1.2	31 00	0 36	1.2	269	271
90	90	36 00	0 00	0.0	35 00	0 00	0.0	34 00	0 00	0.0	33 00	0 00	0.0	32 00	0 00	0.0	31 00	0 00	0.0	270	270

Lat. N.: para AHL > 180°... $Z_n = Z$
para AHL < 180°... $Z_n = 360° - Z$

Lat. S.: para AHL > 180°... $Z_n = 180° - Z$
para AHL < 180°... $Z_n = 180° + Z$

B : (–) para 90° < AHL < 270°
Dec : (–) para la Lat. con signo contrario

TABLA PARA REDUCCION DE VISUALES

Z_1 : mismo signo que B
Z_2 : (–) para F > 90°

Lat. / A	60°			61°			62°			63°			64°			65°			Lat. / A
AHL / F	A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	AHL
° °	° ′	° ′	°	° ′	° ′	°	° ′	° ′	°	° ′	° ′	°	° ′	° ′	°	° ′	° ′	°	° °
0 180	0 00	30 00	90.0	0 00	29 00	90.0	0 00	28 00	90.0	0 00	27 00	90.0	0 00	26 00	90.0	0 00	25 00	90.0	180 360
1 179	0 30	30 00	89.1	0 29	29 00	89.1	0 28	28 00	89.1	0 27	27 00	89.1	0 26	26 00	89.1	0 25	25 00	89.1	181 359
2 178	1 00	29 59	88.3	0 58	28 59	88.3	0 56	27 59	88.2	0 54	26 59	88.2	0 53	25 59	88.2	0 51	24 59	88.2	182 358
3 177	1 30	29 58	87.4	1 27	28 58	87.4	1 24	27 58	87.4	1 22	26 58	87.3	1 19	25 58	87.3	1 16	24 58	87.3	183 357
4 176	2 00	29 56	86.5	1 56	28 56	86.5	1 53	27 57	86.5	1 49	26 57	86.4	1 45	25 57	86.4	1 41	24 57	86.4	184 356
5 175	2 30	29 54	85.7	2 25	28 54	85.6	2 21	27 55	85.6	2 16	26 55	85.5	2 11	25 55	85.5	2 07	24 55	85.5	185 355
6 174	3 00	29 52	84.8	2 54	28 52	84.7	2 49	27 52	84.7	2 43	26 52	84.6	2 38	25 53	84.6	2 32	24 53	84.6	186 354
7 173	3 30	29 49	83.9	3 23	28 49	83.9	3 17	27 49	83.8	3 10	26 50	83.8	3 04	25 50	83.7	2 57	24 50	83.7	187 353
8 172	3 59	29 45	83.1	3 52	28 46	83.0	3 45	27 46	82.9	3 37	26 46	82.9	3 30	25 47	82.8	3 22	24 47	82.7	188 352
9 171	4 29	29 42	82.2	4 21	28 42	82.1	4 13	27 42	82.0	4 04	26 43	82.0	3 56	25 43	81.9	3 47	24 44	81.8	189 351
10 170	4 59	29 37	81.3	4 50	28 38	81.2	4 41	27 38	81.2	4 31	26 39	81.1	4 22	25 39	81.0	4 13	24 40	80.9	190 350
11 169	5 28	29 33	80.4	5 18	28 33	80.4	5 08	27 34	80.3	4 58	26 34	80.2	4 48	25 35	80.1	4 38	24 36	80.0	191 349
12 168	5 58	29 27	79.6	5 47	28 28	79.5	5 36	27 29	79.4	5 25	26 29	79.3	5 14	25 30	79.2	5 02	24 31	79.1	192 348
13 167	6 27	29 22	78.7	6 16	28 22	78.6	6 04	27 23	78.5	5 52	26 24	78.4	5 40	25 25	78.3	5 27	24 26	78.2	193 347
14 166	6 57	29 15	77.8	6 44	28 16	77.7	6 31	27 17	77.6	6 18	26 18	77.5	6 05	25 20	77.4	5 52	24 21	77.3	194 346
15 165	7 26	29 09	76.9	7 13	28 10	76.8	6 59	27 11	76.7	6 45	26 12	76.6	6 31	25 14	76.5	6 17	24 15	76.4	195 345
16 164	7 55	29 02	76.1	7 41	28 03	75.9	7 26	27 04	75.8	7 11	26 06	75.7	6 56	25 07	75.5	6 41	24 09	75.4	196 344
17 163	8 24	28 54	75.2	8 09	27 56	75.0	7 53	26 57	74.9	7 38	25 59	74.8	7 22	25 00	74.6	7 06	24 02	74.5	197 343
18 162	8 53	28 46	74.3	8 37	27 48	74.1	8 20	26 50	74.0	8 04	25 51	73.9	7 47	24 53	73.7	7 30	23 55	73.6	198 342
19 161	9 22	28 38	73.4	9 05	27 40	73.2	8 48	26 41	73.1	8 30	25 43	72.9	8 12	24 45	72.8	7 55	23 48	72.7	199 341
20 160	9 51	28 29	72.5	9 33	27 31	72.3	9 14	26 33	72.2	8 56	25 35	72.0	8 37	24 37	71.9	8 19	23 40	71.7	200 340
21 159	10 19	28 19	71.6	10 00	27 22	71.4	9 41	26 24	71.3	9 22	25 26	71.1	9 02	24 29	71.0	8 43	23 32	70.8	201 339
22 158	10 48	28 10	70.7	10 28	27 12	70.5	10 08	26 15	70.4	9 48	25 17	70.2	9 27	24 20	70.0	9 07	23 23	69.9	202 338
23 157	11 16	27 59	69.8	10 55	27 02	69.6	10 34	26 05	69.5	10 13	25 08	69.3	9 52	24 11	69.1	9 30	23 14	69.0	203 337
24 156	11 44	27 49	68.9	11 22	26 51	68.7	11 00	25 54	68.5	10 38	24 58	68.4	10 16	24 01	68.2	9 54	23 04	68.0	204 336
25 155	12 12	27 37	68.0	11 49	26 40	67.8	11 27	25 44	67.6	11 04	24 47	67.4	10 41	23 51	67.3	10 17	22 55	67.1	205 335
26 154	12 40	27 26	67.1	12 16	26 29	66.9	11 53	25 33	66.7	11 29	24 36	66.5	11 05	23 40	66.3	10 41	22 44	66.2	206 334
27 153	13 07	27 13	66.2	12 43	26 17	66.0	12 18	25 21	65.8	11 54	24 25	65.6	11 29	23 29	65.4	11 04	22 34	65.2	207 333
28 152	13 35	27 01	65.3	13 09	26 05	65.1	12 44	25 09	64.9	12 18	24 13	64.7	11 53	23 18	64.5	11 27	22 23	64.3	208 332
29 151	14 02	26 48	64.4	13 36	25 52	64.1	13 09	24 56	63.9	12 43	24 01	63.7	12 16	23 06	63.5	11 49	22 11	63.3	209 331
30 150	14 29	26 34	63.4	14 02	25 39	63.2	13 35	24 43	63.0	13 07	23 49	62.8	12 40	22 54	62.6	12 12	21 59	62.4	210 330
31 149	14 55	26 20	62.5	14 28	25 25	62.3	14 00	24 30	62.1	13 31	23 36	61.8	13 03	22 41	61.6	12 34	21 47	61.4	211 329
32 148	15 22	26 05	61.6	14 53	25 11	61.3	14 24	24 16	61.1	13 55	23 22	60.9	13 26	22 28	60.7	12 56	21 35	60.5	212 328
33 147	15 48	25 50	60.6	15 19	24 56	60.4	14 49	24 02	60.2	14 19	23 08	59.9	13 49	22 15	59.7	13 18	21 22	59.5	213 327
34 146	16 14	25 35	59.7	15 44	24 41	59.5	15 13	23 47	59.2	14 42	22 54	59.0	14 11	22 01	58.8	13 40	21 08	58.6	214 326
35 145	16 40	25 19	58.8	16 09	24 25	58.5	15 37	23 32	58.3	15 06	22 39	58.0	14 34	21 47	57.8	14 02	20 54	57.6	215 325
36 144	17 05	25 02	57.8	16 33	24 09	57.6	16 01	23 17	57.3	15 29	22 24	57.1	14 56	21 32	56.9	14 23	20 40	56.6	216 324
37 143	17 31	24 45	56.9	16 58	23 53	56.6	16 25	23 00	56.4	15 51	22 09	56.1	15 18	21 17	55.9	14 44	20 26	55.7	217 323
38 142	17 56	24 28	55.9	17 22	23 36	55.7	16 48	22 44	55.4	16 14	21 53	55.2	15 39	21 01	54.9	15 05	20 11	54.7	218 322
39 141	18 20	24 10	55.0	17 46	23 18	54.7	17 11	22 27	54.4	16 36	21 36	54.2	16 01	20 46	54.0	15 25	19 55	53.7	219 321
40 140	18 45	23 52	54.0	18 09	23 00	53.7	17 34	22 10	53.5	16 58	21 19	53.2	16 22	20 29	53.0	15 46	19 39	52.7	220 320
41 139	19 09	23 33	53.0	18 33	22 42	52.8	17 56	21 52	52.5	17 20	21 02	52.2	16 43	20 13	52.0	16 06	19 23	51.8	221 319
42 138	19 33	23 13	52.1	18 56	22 23	51.8	18 19	21 34	51.5	17 41	20 44	51.3	17 03	19 55	51.0	16 26	19 07	50.8	222 318
43 137	19 56	22 54	51.1	19 18	22 04	50.8	18 40	21 15	50.5	18 02	20 26	50.3	17 24	19 38	50.0	16 45	18 50	49.8	223 317
44 136	20 19	22 33	50.1	19 41	21 44	49.8	19 02	20 56	49.5	18 23	20 08	49.3	17 44	19 20	49.0	17 04	18 33	48.8	224 316
45 135	20 42	22 12	49.1	20 03	21 24	48.8	19 23	20 36	48.6	18 43	19 49	48.3	18 03	19 02	48.1	17 23	18 15	47.8	225 315

Lat. / A		60°			61°			62°			63°			64°			65°			Lat. / A	
AHL	/ F	A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	AHL	
°	°	° ′	° ′	°	° ′	° ′	°	° ′	° ′	°	° ′	° ′	°	° ′	° ′	°	° ′	° ′	°	°	°
45	135	20 42	22 12	49.1	20 03	21 24	48.8	19 23	20 36	48.6	18 43	19 49	48.3	18 03	19 02	48.1	17 23	18 15	47.8	225	315
46	134	21 05	21 51	48.1	20 25	21 04	47.8	19 44	20 16	47.6	19 04	19 29	47.3	18 23	18 43	47.1	17 42	17 57	46.8	226	314
47	133	21 27	21 30	47.1	20 46	20 43	46.8	20 05	19 56	46.6	19 24	19 10	46.3	18 42	18 24	46.1	18 00	17 39	45.8	227	313
48	132	21 49	21 07	46.1	21 07	20 21	45.8	20 25	19 35	45.6	19 43	18 50	45.3	19 01	18 04	45.1	18 18	17 20	44.8	228	312
49	131	22 10	20 45	45.1	21 28	19 59	44.8	20 45	19 14	44.6	20 02	18 29	44.3	19 19	17 45	44.0	18 36	17 01	43.8	229	311
50	130	22 31	20 22	44.1	21 48	19 37	43.8	21 05	18 52	43.5	20 21	18 08	43.3	19 37	17 24	43.0	18 53	16 41	42.8	230	310
51	129	22 52	19 58	43.1	22 08	19 14	42.8	21 24	18 30	42.5	20 40	17 47	42.3	19 55	17 04	42.0	19 10	16 21	41.8	231	309
52	128	23 12	19 34	42.1	22 28	18 51	41.8	21 43	18 08	41.5	20 58	17 25	41.2	20 13	16 43	41.0	19 27	16 01	40.8	232	308
53	127	23 32	19 10	41.0	22 47	18 27	40.7	22 01	17 45	40.5	21 15	17 03	40.2	20 30	16 21	40.0	19 44	15 41	39.7	233	307
54	126	23 52	18 45	40.0	23 06	18 03	39.7	22 19	17 21	39.4	21 33	16 40	39.2	20 46	16 00	39.0	20 00	15 20	38.7	234	306
55	125	24 11	18 19	39.0	23 24	17 38	38.7	22 37	16 58	38.4	21 50	16 17	38.2	21 03	15 38	37.9	20 15	14 58	37.7	235	305
56	124	24 29	17 54	37.9	23 42	17 13	37.6	22 54	16 34	37.4	22 07	15 54	37.1	21 19	15 15	36.9	20 31	14 37	36.7	236	304
57	123	24 48	17 27	36.9	23 59	16 48	36.6	23 11	16 09	36.3	22 23	15 31	36.1	21 34	14 53	35.8	20 46	14 15	35.6	237	303
58	122	25 05	17 01	35.8	24 17	16 22	35.5	23 28	15 44	35.3	22 39	15 07	35.0	21 49	14 29	34.8	21 00	13 53	34.6	238	302
59	121	25 23	16 34	34.8	24 33	15 56	34.5	23 44	15 19	34.2	22 54	14 42	34.0	22 04	14 06	33.8	21 14	13 30	33.5	239	301
60	120	25 40	16 06	33.7	24 50	15 29	33.4	23 59	14 53	33.2	23 09	14 18	32.9	22 19	13 42	32.7	21 28	13 07	32.5	240	300
61	119	25 56	15 38	32.6	25 05	15 03	32.4	24 15	14 27	32.1	23 24	13 53	31.9	22 33	13 18	31.7	21 42	12 44	31.5	241	299
62	118	26 12	15 10	31.5	25 21	14 35	31.3	24 29	14 01	31.1	23 38	13 27	30.8	22 46	12 54	30.6	21 55	12 21	30.4	242	298
63	117	26 27	14 41	30.5	25 36	14 08	30.2	24 44	13 34	30.0	23 52	13 01	29.8	22 59	12 29	29.5	22 07	11 57	29.3	243	297
64	116	26 42	14 12	29.4	25 50	13 39	29.1	24 57	13 07	28.9	24 05	12 35	28.7	23 12	12 04	28.5	22 19	11 33	28.3	244	296
65	115	26 57	13 43	28.3	26 04	13 11	28.1	25 11	12 40	27.8	24 18	12 09	27.6	23 25	11 39	27.4	22 31	11 09	27.2	245	295
66	114	27 11	13 13	27.2	26 17	12 42	27.0	25 24	12 12	26.8	24 30	11 43	26.6	23 36	11 13	26.4	22 43	10 44	26.2	246	294
67	113	27 24	12 43	26.1	26 30	12 13	25.9	25 36	11 44	25.7	24 42	11 16	25.5	23 48	10 47	25.3	22 54	10 20	25.1	247	293
68	112	27 37	12 12	25.0	26 43	11 44	24.8	25 48	11 16	24.6	24 54	10 48	24.4	23 59	10 21	24.2	23 04	9 55	24.0	248	292
69	111	27 50	11 41	23.9	26 55	11 14	23.7	26 00	10 47	23.5	25 05	10 21	23.3	24 09	9 55	23.1	23 14	9 29	23.0	249	291
70	110	28 01	11 10	22.8	27 06	10 44	22.6	26 11	10 18	22.4	25 15	9 53	22.2	24 20	9 28	22.0	23 24	9 04	21.9	250	290
71	109	28 13	10 39	21.7	27 17	10 14	21.5	26 21	9 49	21.3	25 25	9 25	21.1	24 29	9 01	21.0	23 33	8 38	20.8	251	289
72	108	28 24	10 07	20.6	27 27	9 43	20.4	26 31	9 20	20.2	25 35	8 57	20.0	24 38	8 34	19.9	23 42	8 12	19.7	252	288
73	107	28 34	9 35	19.4	27 37	9 12	19.3	26 41	8 50	19.1	25 44	8 28	18.9	24 47	8 07	18.8	23 50	7 46	18.6	253	287
74	106	28 44	9 03	18.3	27 47	8 41	18.2	26 50	8 20	18.0	25 52	8 00	17.8	24 55	7 39	17.7	23 58	7 19	17.6	254	286
75	105	28 53	8 30	17.2	27 55	8 10	17.0	26 58	7 50	16.9	26 01	7 31	16.7	25 03	7 12	16.6	24 06	6 53	16.5	255	285
76	104	29 01	7 57	16.1	28 04	7 38	15.9	27 06	7 20	15.8	26 08	7 02	15.6	25 10	6 44	15.5	24 13	6 26	15.4	256	284
77	103	29 09	7 24	14.9	28 11	7 06	14.8	27 13	6 49	14.7	26 15	6 32	14.5	25 17	6 16	14.4	24 19	5 59	14.3	257	283
78	102	29 17	6 51	13.8	28 18	6 34	13.7	27 20	6 19	13.5	26 22	6 03	13.4	25 23	5 47	13.3	24 25	5 32	13.2	258	282
79	101	29 24	6 17	12.7	28 25	6 02	12 5	27 27	5 48	12.4	26 28	5 33	12.3	25 29	5 19	12.2	24 31	5 05	12.1	259	281
80	100	29 30	5 44	11.5	28 31	5 30	11.4	27 32	5 17	11.3	26 33	5 03	11.2	25 35	4 50	11.1	24 36	4 38	11.0	260	280
81	99	29 36	5 10	10.4	28 37	4 57	10.3	27 38	4 45	10.2	26 38	4 33	10.1	25 39	4 22	10.0	24 40	4 10	9.9	261	279
82	98	29 41	4 36	9.2	28 41	4 25	9.1	27 42	4 14	9.0	26 43	4 03	9.0	25 44	3 53	8.9	24 44	3 43	8.8	262	278
83	97	29 45	4 01	8.1	28 46	3 52	8.0	27 46	3 42	7.9	26 47	3 33	7.8	25 48	3 24	7.8	24 48	3 15	7.7	263	277
84	96	29 49	3 27	6.9	28 50	3 19	6.9	27 50	3 11	6.8	26 50	3 03	6.7	25 51	2 55	6.7	24 51	2 47	6.6	264	276
85	95	29 52	2 53	5.8	28 53	2 46	5.7	27 53	2 39	5.7	26 53	2 33	5.6	25 54	2 26	5.6	24 54	2 20	5.5	265	275
86	94	29 55	2 18	4.6	28 55	2 13	4.6	27 56	2 07	4.5	26 56	2 02	4.5	25 56	1 57	4.4	24 56	1 52	4.4	266	274
87	93	29 57	1 44	3.5	28 57	1 40	3.4	27 57	1 36	3.4	26 58	1 32	3.4	25 58	1 28	3.3	24 58	1 24	3.3	267	273
88	92	29 59	1 09	2.3	28 59	1 06	2.3	27 59	1 04	2.3	26 59	1 01	2.2	25 59	0 59	2.2	24 59	0 56	2.2	268	272
89	91	30 00	0 35	1.2	29 00	0 33	1.1	28 00	0 32	1.1	27 00	0 31	1.1	26 00	0 29	1.1	25 00	0 28	1.1	269	271
90	90	30 00	0 00	0.0	29 00	0 00	0.0	28 00	0 00	0.0	27 00	0 00	0.0	26 00	0 00	0.0	25 00	0 00	0.0	270	270

Lat. N.: para AHL > 180°... $Z_n = Z$
para AHL < 180°... $Z_n = 360° - Z$

Lat. S.: para AHL > 180°... $Z_n = 180° - Z$
para AHL < 180°... $Z_n = 180° + Z$

B : (–) para 90° < AHL < 270°
Dec : (–) para la Lat. con signo contrario

TABLA PARA REDUCCION DE VISUALES

Z_1 : mismo signo que B
Z_2 : (–) para F > 90°

Lat. / A		66°			67°			68°			69°			70°			71°			Lat. / A	
AHL / F		A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	AHL	
°	°	° ′	° ′	°	° ′	° ′	°	° ′	° ′	°	° ′	° ′	°	° ′	° ′	°	° ′	° ′	°	°	°
0	180	0 00	24 00	90.0	0 00	23 00	90.0	0 00	22 00	90.0	0 00	21 00	90.0	0 00	20 00	90.0	0 00	19 00	90.0	180	360
1	179	0 24	24 00	89.1	0 23	23 00	89.1	0 22	22 00	89.1	0 22	21 00	89.1	0 21	20 00	89.1	0 20	19 00	89.1	181	359
2	178	0 49	23 59	88.2	0 47	22 59	88.2	0 45	21 59	88.1	0 43	20 59	88.1	0 41	19 59	88.1	0 39	18 59	88.1	182	358
3	177	1 13	23 58	87.3	1 10	22 58	87.2	1 07	21 58	87.2	1 04	20 58	87.2	1 02	19 58	87.2	0 59	18 59	87.2	183	357
4	176	1 36	23 57	86.3	1 34	22 57	86.3	1 30	21 57	86.3	1 26	20 57	86.3	1 22	19 57	86.2	1 18	18 57	86.2	184	356
5	175	2 02	23 55	85.4	1 57	22 55	85.4	1 52	21 55	85.4	1 47	20 56	85.3	1 42	19 56	85.3	1 38	18 56	85.3	185	355
6	174	2 26	23 53	84.5	2 20	22 53	84.5	2 15	21 53	84.4	2 09	20 54	84.4	2 03	19 54	84.4	1 57	18 54	84.3	186	354
7	173	2 50	23 50	83.6	2 44	22 51	83.6	2 37	21 51	83.5	2 30	20 51	83.5	2 23	19 52	83.4	2 16	18 52	83.4	187	353
8	172	3 15	23 48	82.7	3 07	22 48	82.6	2 59	21 48	82.6	2 52	20 49	82.5	2 44	19 49	82.5	2 36	18 50	82.4	188	352
9	171	3 39	23 44	81.8	3 30	22 45	81.7	3 22	21 45	81.6	3 13	20 46	81.6	3 04	19 46	81.5	2 55	18 47	81.5	189	351
10	170	4 03	23 41	80.8	3 53	22 41	80.8	3 44	21 42	80.7	3 34	20 42	80.7	3 24	19 43	80.6	3 14	18 44	80.5	190	350
11	169	4 27	23 36	79.9	4 17	22 37	79.9	4 06	21 38	79.8	3 55	20 39	79.7	3 45	19 40	79.6	3 34	18 41	79.6	191	349
12	168	4 51	23 32	79.0	4 40	22 33	78.9	4 28	21 34	78.9	4 16	20 35	78.8	4 05	19 36	78.7	3 53	18 37	78.6	192	348
13	167	5 15	23 27	78.1	5 03	22 28	78.0	4 50	21 29	77.9	4 37	20 30	77.8	4 25	19 32	77.8	4 12	18 33	77.7	193	347
14	166	5 39	23 22	77.2	5 25	22 23	77.1	5 12	21 24	77.0	4 58	20 26	76.9	4 45	19 27	76.8	4 31	18 28	76.7	194	346
15	165	6 03	23 16	76.2	5 48	22 18	76.1	5 34	21 19	76.0	5 19	20 21	76.0	5 05	19 22	75.9	4 50	18 24	75.8	195	345
16	164	6 26	23 10	75.3	6 11	22 12	75.2	5 56	21 13	75.1	5 40	20 15	75.0	5 25	19 17	74.9	5 09	18 19	74.8	196	344
17	163	6 50	23 04	74.4	6 34	22 06	74.3	6 17	21 08	74.2	6 01	20 09	74.1	5 44	19 11	74.0	5 28	18 14	73.9	197	343
18	162	7 13	22 57	73.5	6 56	21 59	73.3	6 39	21 01	73.2	6 21	20 03	73.1	6 04	19 06	73.0	5 46	18 08	72.9	198	342
19	161	7 37	22 50	72.5	7 19	21 52	72.4	7 00	20 54	72.3	6 42	19 57	72.2	6 24	18 59	72.1	6 05	18 02	72.0	199	341
20	160	8 00	22 42	71.6	7 41	21 45	71.5	7 22	20 47	71.4	7 02	19 50	71.2	6 43	18 53	71.1	6 24	17 56	71.0	200	340
21	159	8 23	22 34	70.7	8 03	21 37	70.5	7 43	20 40	70.4	7 23	19 43	70.3	7 02	18 46	70.2	6 42	17 49	70.1	201	339
22	158	8 46	22 26	69.7	8 25	21 29	69.6	8 04	20 32	69.5	7 43	19 35	69.3	7 22	18 39	69.2	7 00	17 42	69.1	202	338
23	157	9 09	22 17	68.8	8 47	21 21	68.7	8 25	20 24	68.5	8 03	19 28	68.4	7 41	18 31	68.3	7 19	17 35	68.1	203	337
24	156	9 31	22 08	67.9	9 09	21 12	67.7	8 46	20 16	67.6	8 23	19 19	67.4	8 00	18 24	67.3	7 37	17 28	67.2	204	336
25	155	9 54	21 58	66.9	9 30	21 03	66.8	9 07	20 07	66.6	8 43	19 11	66.5	8 19	18 15	66.3	7 55	17 20	66.2	205	335
26	154	10 16	21 49	66.0	9 52	20 53	65.8	9 27	19 57	65.7	9 02	19 02	65.5	8 37	18 07	65.4	8 12	17 12	65.2	206	334
27	153	10 38	21 38	65.0	10 13	20 43	64.9	9 48	19 48	64.7	9 22	18 53	64.6	8 56	17 58	64.4	8 30	17 03	64.3	207	333
28	152	11 00	21 28	64.1	10 34	20 33	63.9	10 08	19 38	63.8	9 41	18 43	63.6	9 14	17 49	63.5	8 48	16 55	63.3	208	332
29	151	11 22	21 17	63.1	10 55	20 22	63.0	10 28	19 28	62.8	10 00	18 34	62.6	9 33	17 39	62.5	9 05	16 46	62.3	209	331
30	150	11 44	21 05	62.2	11 16	20 11	62.0	10 48	19 17	61.8	10 19	18 23	61.7	9 51	17 30	61.5	9 22	16 36	61.4	210	330
31	149	12 06	20 53	61.2	11 37	20 00	61.1	11 07	19 06	60.9	10 38	18 13	60.7	10 09	17 20	60.5	9 39	16 27	60.4	211	329
32	148	12 27	20 41	60.3	11 57	19 48	60.1	11 27	18 55	59.9	10 57	18 02	59.7	10 27	17 09	59.6	9 56	16 17	59.4	212	328
33	147	12 48	20 29	59.3	12 17	19 36	59.1	11 46	18 43	58.9	11 15	17 51	58.8	10 44	16 58	58.6	10 13	16 06	58.4	213	327
34	146	13 09	20 16	58.4	12 37	19 23	58.2	12 06	18 31	58.0	11 34	17 39	57.8	11 02	16 47	57.6	10 29	15 56	57.5	214	326
35	145	13 29	20 02	57.4	12 57	19 10	57.2	12 24	18 19	57.0	11 52	17 27	56.8	11 19	16 36	56.7	10 46	15 45	56.5	215	325
36	144	13 50	19 49	56.4	13 17	18 57	56.2	12 43	18 06	56.0	12 10	17 15	55.9	11 36	16 24	55.7	11 02	15 34	55.5	216	324
37	143	14 10	19 34	55.5	13 36	18 44	55.3	13 02	17 53	55.1	12 27	17 03	54.9	11 53	16 12	54.7	11 18	15 23	54.5	217	323
38	142	14 30	19 20	54.5	13 55	18 30	54.3	13 20	17 40	54.1	12 45	16 50	53.9	12 09	16 00	53.7	11 34	15 11	53.5	218	322
39	141	14 50	19 05	53.5	14 14	18 15	53.3	13 38	17 26	53.1	13 02	16 37	52.9	12 26	15 48	52.7	11 49	14 59	52.6	219	321
40	140	15 09	18 50	52.5	14 33	18 01	52.3	13 56	17 12	52.1	13 19	16 23	51.9	12 42	15 35	51.7	12 05	14 47	51.6	220	320
41	139	15 29	18 34	51.5	14 51	17 46	51.3	14 14	16 57	51.1	13 36	16 09	50.9	12 58	15 22	50.8	12 20	14 34	50.6	221	319
42	138	15 48	18 18	50.6	15 09	17 30	50.3	14 31	16 43	50.1	13 52	15 55	49.9	13 14	15 08	49.8	12 35	14 21	49.6	222	318
43	137	16 06	18 02	49.6	15 27	17 15	49.4	14 48	16 28	49.2	14 09	15 41	49.0	13 29	14 54	48.8	12 50	14 08	48.6	223	317
44	136	16 25	17 46	48.6	15 45	16 59	48.4	15 05	16 12	48.2	14 25	15 26	48.0	13 45	14 40	47.8	13 04	13 55	47.6	224	316
45	135	16 43	17 29	47.6	16 02	16 42	47.4	15 22	15 57	47.2	14 41	15 11	47.0	14 00	14 26	46.8	13 19	13 41	46.6	225	315

Lat. / A		66°			67°			68°			69°			70°			71°			Lat. / A	
AHL / F		A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	AHL	
°	°	° ′	° ′	°	° ′	° ′	°	° ′	° ′	°	° ′	° ′	°	° ′	° ′	°	° ′	° ′	°	°	°
45	135	16 43	17 29	47.6	16 02	16 42	47.4	15 22	15 57	47.2	14 41	15 11	47.0	14 00	14 26	46.8	13 19	13 41	46.6	225	315
46	134	17 01	17 11	46.6	16 19	16 26	46.4	15 38	15 41	46.2	14 56	14 56	46.0	14 15	14 11	45.8	13 33	13 27	45.6	226	314
47	133	17 18	16 53	45.6	16 36	16 09	45.4	15 54	15 24	45.2	15 12	14 40	45.0	14 29	13 56	44.8	13 46	13 13	44.6	227	313
48	132	17 36	16 35	44.6	16 53	15 51	44.4	16 10	15 08	44.2	15 27	14 24	44.0	14 43	13 41	43.8	14 00	12 58	43.6	228	312
49	131	17 53	16 17	43.6	17 09	15 34	43.4	16 25	14 51	43.2	15 42	14 08	43.0	14 58	13 26	42.8	14 13	12 44	42.6	229	311
50	130	18 09	15 58	42.6	17 25	15 16	42.4	16 41	14 33	42.1	15 56	13 52	41.9	15 11	13 10	41.8	14 27	12 29	41.6	230	310
51	129	18 26	15 39	41.6	17 41	14 57	41.3	16 56	14 16	41.1	16 10	13 35	40.9	15 25	12 54	40.8	14 39	12 14	40.6	231	309
52	128	18 42	15 20	40.5	17 56	14 39	40.3	17 10	13 58	40.1	16 24	13 18	39.9	15 38	12 38	39.7	14 52	11 58	39.6	232	308
53	127	18 57	15 00	39.5	18 11	14 20	39.3	17 24	13 40	39.1	16 38	13 00	38.9	15 51	12 21	38.7	15 04	11 42	38.6	233	307
54	126	19 13	14 40	38.5	18 26	14 01	38.3	17 39	13 22	38.1	16 51	12 43	37.9	16 04	12 05	37.7	15 16	11 26	37.5	234	306
55	125	19 28	14 20	37.5	18 40	13 41	37.3	17 52	13 03	37.1	17 04	12 25	36.9	16 16	11 48	36.7	15 28	11 10	36.5	235	305
56	124	19 42	13 59	36.4	18 54	13 21	36.2	18 06	12 44	36.0	17 17	12 07	35.8	16 28	11 30	35.7	15 40	10 54	35.5	236	304
57	123	19 57	13 38	35.4	19 08	13 01	35.2	18 19	12 25	35.0	17 29	11 49	34.8	16 40	11 13	34.6	15 51	10 37	34.5	237	303
58	122	20 11	13 17	34.4	19 21	12 41	34.2	18 31	12 05	34.0	17 42	11 30	33.8	16 52	10 55	33.6	16 02	10 20	33.5	238	302
59	121	20 24	12 55	33.3	19 34	12 20	33.1	18 44	11 45	32.9	17 53	11 11	32.8	17 03	10 37	32.6	16 12	10 03	32.4	239	301
60	120	20 37	12 33	32.3	19 47	11 59	32.1	18 56	11 25	31.9	18 05	10 52	31.7	17 14	10 19	31.6	16 23	9 46	31.4	240	300
61	119	20 50	12 11	31.2	19 59	11 38	31.1	19 08	11 05	30.9	18 16	10 33	30.7	17 24	10 00	30.5	16 33	9 29	30.4	241	299
62	118	21 03	11 48	30.2	20 11	11 16	30.0	19 19	10 44	29.8	18 27	10 13	29.7	17 35	9 42	29.5	16 42	9 11	29.4	242	298
63	117	21 15	11 26	29.2	20 22	10 54	29.0	19 30	10 24	28.8	18 37	9 53	28.6	17 45	9 23	28.5	16 52	8 53	28.3	243	297
64	116	21 27	11 03	28.1	20 34	10 32	27.9	19 41	10 03	27.7	18 47	9 33	27.6	17 54	9 04	27.4	17 01	8 35	27.3	244	296
65	115	21 38	10 39	27.0	20 44	10 10	26.9	19 51	9 41	26.7	18 57	9 13	26.5	18 03	8 45	26.4	17 10	8 17	26.3	245	295
66	114	21 49	10 16	26.0	20 55	9 48	25.8	20 01	9 20	25.7	19 07	8 52	25.5	18 12	8 25	25.4	17 18	7 58	25.2	246	294
67	113	21 59	9 52	24.9	21 05	9 25	24.8	20 10	8 58	24.6	19 16	8 32	24.5	18 21	8 06	24.3	17 26	7 40	24.2	247	293
68	112	22 09	9 28	23.9	21 14	9 02	23.7	20 19	8 36	23.5	19 24	8 11	23.4	18 29	7 46	23.3	17 34	7 21	23.1	248	292
69	111	22 19	9 04	22.8	21 24	8 39	22.6	20 28	8 14	22.5	19 33	7 50	22.4	18 37	7 26	22.2	17 42	7 02	22.1	249	291
70	110	22 28	8 40	21.7	21 32	8 16	21.6	20 37	7 52	21.4	19 41	7 29	21.3	18 45	7 06	21.2	17 49	6 43	21.1	250	290
71	109	22 37	8 15	20.7	21 41	7 52	20.5	20 45	7 30	20.4	19 48	7 07	20.2	18 52	6 45	20.1	17 56	6 24	20.0	251	289
72	108	22 45	7 50	19.6	21 49	7 28	19.4	20 52	7 07	19.3	19 56	6 46	19.2	18 59	6 25	19.1	18 02	6 04	19.0	252	288
73	107	22 53	7 25	18.5	21 56	7 04	18.4	21 00	6 44	18.2	20 03	6 24	18.1	19 05	6 04	18.0	18 08	5 45	17.9	253	287
74	106	23 01	7 00	17.4	22 04	6 40	17.3	21 06	6 21	17.2	20 09	6 02	17.1	19 12	5 44	17.0	18 14	5 25	16.9	254	286
75	105	23 08	6 34	16.3	22 10	6 16	16.2	21 13	5 58	16.1	20 15	5 40	16.0	19 17	5 23	15.9	18 20	5 06	15.8	255	285
76	104	23 15	6 09	15.3	22 17	5 52	15.2	21 19	5 35	15.1	20 21	5 18	15.0	19 23	5 02	14.9	18 25	4 46	14.8	256	284
77	103	23 21	5 43	14.2	22 23	5 27	14.1	21 24	5 12	14.0	20 26	4 56	13.9	19 28	4 41	13.8	18 30	4 26	13.7	257	283
78	102	23 27	5 17	13.1	22 28	5 03	13.0	21 30	4 48	12.9	20 31	4 34	12.8	19 33	4 20	12.7	18 34	4 06	12.7	258	282
79	101	23 32	4 51	12.0	22 33	4 38	11.9	21 35	4 24	11.8	20 36	4 11	11.8	19 37	3 58	11.7	18 38	3 46	11.6	259	281
80	100	23 37	4 25	10.9	22 38	4 13	10.8	21 39	4 01	10.8	20 40	3 49	10.7	19 41	3 37	10.6	18 42	3 25	10.6	260	280
81	99	23 41	3 59	9.8	22 42	3 48	9.8	21 43	3 37	9.7	20 44	3 26	9.6	19 45	3 16	9.6	18 45	3 05	9.5	261	279
82	98	23 45	3 33	8.7	22 46	3 23	8.7	21 46	3 13	8.6	20 47	3 03	8.6	19 48	2 54	8.5	18 48	2 45	8.5	262	278
83	97	23 49	3 06	7.7	22 49	2 58	7.6	21 50	2 49	7.5	20 50	2 41	7.5	19 51	2 32	7.4	18 51	2 24	7.4	263	277
84	96	23 52	2 40	6.6	22 52	2 32	6.5	21 52	2 25	6.5	20 53	2 18	6.4	19 53	2 11	6.4	18 54	2 04	6.3	264	276
85	95	23 54	2 13	5.5	22 54	2 07	5.4	21 55	2 01	5.4	20 55	1 55	5.4	19 55	1 49	5.3	18 55	1 43	5.3	265	275
86	94	23 56	1 47	4.4	22 56	1 42	4.3	21 57	1 37	4.3	20 57	1 32	4.3	19 57	1 27	4.3	18 57	1 23	4.2	266	274
87	93	23 58	1 20	3.3	22 58	1 16	3.3	21 58	1 13	3.2	20 58	1 09	3.2	19 58	1 05	3.2	18 58	1 02	3.2	267	273
88	92	23 59	0 53	2.2	22 59	0 51	2.2	21 59	0 48	2.2	20 59	0 46	2.1	19 59	0 44	2.1	18 59	0 41	2.1	268	272
89	91	24 00	0 27	1.1	23 00	0 25	1.1	22 00	0 24	1.1	21 00	0 23	1.1	20 00	0 22	1.1	19 00	0 21	1.1	269	271
90	90	24 00	0 00	0.0	23 00	0 00	0.0	22 00	0 00	0.0	21 00	0 00	0.0	20 00	0 00	0.0	19 00	0 00	0.0	270	270

Lat. N.: para AHL > 180°... $Z_n = Z$
para AHL < 180°... $Z_n = 360° - Z$

Lat. S.: para AHL > 180°... $Z_n = 180° - Z$
para AHL < 180°... $Z_n = 180° + Z$

B : (–) para 90° < AHL < 270°
Dec : (–) para la Lat. con signo contrario

TABLA PARA REDUCCION DE VISUALES

Z_1 : mismo signo que B
Z_2 : (–) para F > 90°

Lat. / A	72°			73°			74°			75°			76°			77°			Lat. / A
AHL / F	A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	AHL
° °	° ′	° ′	°	° ′	° ′	°	° ′	° ′	°	° ′	° ′	°	° ′	° ′	°	° ′	° ′	°	° °
0 180	0 00	18 00	90.0	0 00	17 00	90.0	0 00	16 00	90.0	0 00	15 00	90.0	0 00	14 00	90.0	0 00	13 00	90.0	180 360
1 179	0 19	18 00	89.0	0 18	17 00	89.0	0 17	16 00	89.0	0 16	15 00	89.0	0 15	14 00	89.0	0 13	13 00	89.0	181 359
2 178	0 37	17 59	88.1	0 35	16 59	88.1	0 33	15 59	88.1	0 31	14 59	88.1	0 29	14 00	88.1	0 27	13 00	88.1	182 358
3 177	0 56	17 59	87.1	0 53	16 59	87.1	0 50	15 59	87.1	0 47	14 59	87.1	0 44	13 59	87.1	0 40	12 59	87.1	183 357
4 176	1 14	17 58	86.2	1 10	16 58	86.2	1 06	15 58	86.2	1 02	14 58	86.1	0 58	13 58	86.1	0 54	12 58	86.1	184 356
5 175	1 33	17 56	85.2	1 28	16 56	85.2	1 23	15 57	85.2	1 18	14 57	85.2	1 12	13 57	85.1	1 07	12 57	85.1	185 355
6 174	1 51	17 54	84.3	1 45	16 55	84.3	1 39	15 55	84.2	1 33	14 55	84.2	1 27	13 56	84.2	1 21	12 56	84.2	186 354
7 173	2 09	17 52	83.3	2 03	16 53	83.3	1 56	15 53	83.3	1 48	14 54	83.2	1 41	13 54	83.2	1 34	12 54	83.2	187 353
8 172	2 28	17 50	82.4	2 20	16 51	82.3	2 12	15 51	82.3	2 04	14 52	82.3	1 56	13 52	82.2	1 48	12 53	82.2	188 352
9 171	2 46	17 48	81.4	2 37	16 48	81.4	2 28	15 49	81.3	2 19	14 49	81.3	2 10	13 50	81.3	2 01	12 51	81.2	189 351
10 170	3 05	17 45	80.5	2 55	16 45	80.4	2 45	15 46	80.4	2 35	14 47	80.3	2 24	13 48	80.3	2 14	12 49	80.3	190 350
11 169	3 23	17 41	79.5	3 12	16 42	79.5	3 01	15 43	79.4	2 50	14 44	79.4	2 39	13 45	79.3	2 28	12 46	79.3	191 349
12 168	3 41	17 38	78.6	3 29	16 39	78.5	3 17	15 40	78.5	3 05	14 41	78.4	2 53	13 42	78.3	2 41	12 44	78.3	192 348
13 167	3 59	17 34	77.6	3 46	16 35	77.5	3 33	15 37	77.5	3 20	14 38	77.4	3 07	13 39	77.4	2 54	12 41	77.3	193 347
14 166	4 17	17 30	76.7	4 03	16 31	76.6	3 49	15 33	76.5	3 35	14 34	76.5	3 21	13 36	76.4	3 07	12 38	76.3	194 346
15 165	4 35	17 25	75.7	4 20	16 27	75.6	4 05	15 29	75.6	3 50	14 31	75.5	3 35	13 32	75.4	3 20	12 34	75.4	195 345
16 164	4 53	17 21	74.7	4 37	16 23	74.7	4 21	15 25	74.6	4 05	14 27	74.5	3 49	13 29	74.5	3 33	12 31	74.4	196 344
17 163	5 11	17 16	73.8	4 54	16 18	73.7	4 37	15 20	73.6	4 20	14 22	73.5	4 03	13 25	73.5	3 46	12 27	73.4	197 343
18 162	5 29	17 10	72.8	5 11	16 13	72.7	4 53	15 15	72.7	4 35	14 18	72.6	4 17	13 20	72.5	3 59	12 23	72.4	198 342
19 161	5 46	17 05	71.9	5 28	16 07	71.8	5 09	15 10	71.7	4 50	14 13	71.6	4 31	13 16	71.5	4 12	12 19	71.5	199 341
20 160	6 04	16 59	70.9	5 44	16 02	70.8	5 25	15 05	70.7	5 05	14 08	70.6	4 45	13 11	70.5	4 25	12 14	70.5	200 340
21 159	6 21	16 52	69.9	6 01	15 56	69.8	5 40	14 59	69.7	5 19	14 03	69.7	4 58	13 06	69.6	4 37	12 10	69.5	201 339
22 158	6 39	16 46	69.0	6 17	15 50	68.9	5 56	14 53	68.8	5 34	13 57	68.7	5 12	13 01	68.6	4 50	12 05	68.5	202 338
23 157	6 56	16 39	68.0	6 34	15 43	67.9	6 11	14 47	67.8	5 48	13 51	67.7	5 25	12 56	67.6	5 03	12 00	67.5	203 337
24 156	7 13	16 32	67.1	6 50	15 36	66.9	6 26	14 41	66.8	6 03	13 45	66.7	5 39	12 50	66.6	5 15	11 55	66.5	204 336
25 155	7 30	16 25	66.1	7 06	15 29	66.0	6 41	14 34	65.9	6 17	13 39	65.8	5 52	12 44	65.7	5 27	11 49	65.6	205 335
26 154	7 47	16 17	65.1	7 22	15 22	65.0	6 56	14 27	64.9	6 31	13 32	64.8	6 05	12 38	64.7	5 40	11 43	64.6	206 334
27 153	8 04	16 09	64.1	7 38	15 14	64.0	7 11	14 20	63.9	6 45	13 26	63.8	6 18	12 32	63.7	5 52	11 37	63.6	207 333
28 152	8 20	16 00	63.2	7 53	15 06	63.0	7 26	14 12	62.9	6 59	13 19	62.8	6 31	12 25	62.7	6 04	11 31	62.6	208 332
29 151	8 37	15 52	62.2	8 09	14 58	62.1	7 41	14 05	61.9	7 13	13 11	61.8	6 44	12 18	61.7	6 16	11 25	61.6	209 331
30 150	8 53	15 43	61.2	8 24	14 50	61.1	7 55	13 57	61.0	7 26	13 04	60.9	6 57	12 11	60.7	6 27	11 18	60.6	210 330
31 149	9 09	15 34	60.3	8 40	14 41	60.1	8 10	13 49	60.0	7 40	12 56	59.9	7 09	12 04	59.8	6 39	11 12	59.7	211 329
32 148	9 25	15 24	59.3	8 55	14 32	59.1	8 24	13 40	59.0	7 53	12 48	58.9	7 22	11 56	58.8	6 51	11 05	58.7	212 328
33 147	9 41	15 15	58.3	9 10	14 23	58.2	8 38	13 31	58.0	8 06	12 40	57.9	7 34	11 49	57.8	7 02	10 57	57.7	213 327
34 146	9 57	15 05	57.3	9 25	14 13	57.2	8 52	13 22	57.0	8 19	12 31	56.9	7 46	11 41	56.8	7 14	10 50	56.7	214 326
35 145	10 13	14 54	56.3	9 39	14 04	56.2	9 06	13 13	56.1	8 32	12 23	55.9	7 59	11 33	55.8	7 25	10 43	55.7	215 325
36 144	10 28	14 44	55.4	9 54	13 54	55.2	9 19	13 04	55.1	8 45	12 14	54.9	8 11	11 24	54.8	7 36	10 35	54.7	216 324
37 143	10 43	14 33	54.4	10 08	13 43	54.2	9 33	12 54	54.1	8 58	12 05	53.9	8 22	11 16	53.8	7 47	10 27	53.7	217 323
38 142	10 58	14 22	53.4	10 22	13 33	53.2	9 46	12 44	53.1	9 10	11 55	53.0	8 34	11 07	52.8	7 58	10 19	52.7	218 322
39 141	11 13	14 10	52.4	10 36	13 22	52.2	9 59	12 34	52.1	9 22	11 46	52.0	8 45	10 58	51.8	8 08	10 10	51.7	219 321
40 140	11 27	13 59	51.4	10 50	13 11	51.3	10 12	12 23	51.1	9 35	11 36	51.0	8 57	10 49	50.8	8 19	10 02	50.7	220 320
41 139	11 42	13 47	50.4	11 04	13 00	50.3	10 25	12 13	50.1	9 47	11 26	50.0	9 08	10 39	49.9	8 29	9 53	49.7	221 319
42 138	11 56	13 34	49.4	11 17	12 48	49.3	10 38	12 02	49.1	9 58	11 16	49.0	9 19	10 30	48.9	8 39	9 44	48.7	222 318
43 137	12 10	13 22	48.4	11 30	12 36	48.3	10 50	11 51	48.1	10 10	11 05	48.0	9 30	10 20	47.9	8 49	9 35	47.7	223 317
44 136	12 24	13 09	47.4	11 43	12 24	47.3	11 02	11 39	47.1	10 21	10 55	47.0	9 40	10 10	46.9	8 59	9 26	46.7	224 316
45 135	12 37	12 56	46.4	11 56	12 12	46.3	11 14	11 28	46.1	10 33	10 44	46.0	9 51	10 00	45.9	9 09	9 16	45.7	225 315

Lat. / A		72°			73°			74°			75°			76°			77°			Lat. / A	
AHL / F		A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	AHL	
°	°	° ′	° ′	°	° ′	° ′	°	° ′	° ′	°	° ′	° ′	°	° ′	° ′	°	° ′	° ′	°	°	°
45	135	12 37	12 56	46.4	11 56	12 12	46.3	11 14	11 28	46.1	10 33	10 44	46.0	9 51	10 00	45.9	9 09	9 16	45.7	225	315
46	134	12 51	12 43	45.4	12 08	11 59	45.3	11 26	11 16	45.1	10 44	10 33	45.0	10 01	9 50	44.9	9 19	9 07	44.7	226	314
47	133	13 04	12 30	44.4	12 21	11 47	44.3	11 38	11 04	44.1	10 55	10 21	44.0	10 11	9 39	43.9	9 28	8 57	43.7	227	313
48	132	13 17	12 16	43.4	12 33	11 34	43.3	11 49	10 52	43.1	11 05	10 10	43.0	10 21	9 28	42.9	9 37	8 47	42.7	228	312
49	131	13 29	12 02	42.4	12 45	11 21	42.3	12 00	10 39	42.1	11 16	9 58	42.0	10 31	9 17	41.9	9 46	8 37	41.7	229	311
50	130	13 42	11 48	41.4	12 57	11 07	41.3	12 11	10 27	41.1	11 26	9 46	41.0	10 41	9 06	40.9	9 55	8 26	40.7	230	310
51	129	13 54	11 33	40.4	13 08	10 53	40.3	12 22	10 14	40.1	11 36	9 34	40.0	10 50	8 55	39.8	10 04	8 16	39.7	231	309
52	128	14 06	11 19	39.4	13 19	10 40	39.2	12 33	10 01	39.1	11 46	9 22	39.0	10 59	8 44	38.8	10 13	8 05	38.7	232	308
53	127	14 17	11 04	38.4	13 30	10 26	38.2	12 43	9 47	38.1	11 56	9 10	38.0	11 08	8 32	37.8	10 21	7 55	37.7	233	307
54	126	14 29	10 49	37.4	13 41	10 11	37.2	12 53	9 34	37.1	12 05	8 57	36.9	11 17	8 20	36.8	10 29	7 44	36.7	234	306
55	125	14 40	10 33	36.4	13 51	9 57	36.2	13 03	9 20	36.1	12 14	8 44	35.9	11 26	8 08	35.8	10 37	7 33	35.7	235	305
56	124	14 51	10 18	35.3	14 02	9 42	35.2	13 13	9 07	35.1	12 23	8 31	34.9	11 34	7 56	34.8	10 45	7 21	34.7	236	304
57	123	15 01	10 02	34.3	14 12	9 27	34.2	13 22	8 53	34.0	12 32	8 18	33.9	11 42	7 44	33.8	10 52	7 10	33.7	237	303
58	122	15 12	9 46	33.3	14 21	9 12	33.2	13 31	8 38	33.0	12 41	8 05	32.9	11 50	7 32	32.8	11 00	6 59	32.7	238	302
59	121	15 22	9 30	32.3	14 31	8 57	32.1	13 40	8 24	32.0	12 49	7 51	31.9	11 58	7 19	31.8	11 07	6 47	31.7	239	301
60	120	15 31	9 14	31.3	14 40	8 41	31.1	13 49	8 10	31.0	12 57	7 38	30.9	12 06	7 06	30.8	11 14	6 35	30.6	240	300
61	119	15 41	8 57	30.2	14 49	8 26	30.1	13 57	7 55	30.0	13 05	7 24	29.8	12 13	6 54	29.7	11 21	6 23	29.6	241	299
62	118	15 50	8 40	29.2	14 58	8 10	29.1	14 05	7 40	28.9	13 13	7 10	28.8	12 20	6 41	28.7	11 27	6 11	28.6	242	298
63	117	15 59	8 23	28.2	15 06	7 54	28.0	14 13	7 25	27.9	13 20	6 56	27.8	12 27	6 27	27.7	11 34	5 59	27.6	243	297
64	116	16 08	8 06	27.2	15 14	7 38	27.0	14 21	7 10	26.9	13 27	6 42	26.8	12 34	6 14	26.7	11 40	5 47	26.6	244	296
65	115	16 16	7 49	26.1	15 22	7 22	26.0	14 28	6 55	25.9	13 34	6 28	25.8	12 40	6 01	25.7	11 46	5 34	25.6	245	295
66	114	16 24	7 32	25.1	15 29	7 05	25.0	14 35	6 39	24.9	13 41	6 13	24.7	12 46	5 47	24.6	11 52	5 22	24.6	246	294
67	113	16 32	7 14	24.1	15 37	6 49	23.9	14 42	6 24	23.8	13 47	5 59	23.7	12 52	5 34	23.6	11 57	5 09	23.5	247	293
68	112	16 39	6 56	23.0	15 44	6 32	22.9	14 48	6 08	22.8	13 53	5 44	22.7	12 58	5 20	22.6	12 02	4 57	22.5	248	292
69	111	16 46	6 39	22.0	15 50	6 15	21.9	14 55	5 52	21.8	13 59	5 29	21.7	13 03	5 06	21.6	12 07	4 44	21.5	249	291
70	110	16 53	6 20	20.9	15 57	5 58	20.8	15 01	5 36	20.7	14 05	5 14	20.6	13 08	4 52	20.6	12 12	4 31	20.5	250	290
71	109	16 59	6 02	19.9	16 03	5 41	19.8	15 06	5 20	19.7	14 10	4 59	19.6	13 13	4 38	19.5	12 17	4 18	19.5	251	289
72	108	17 05	5 44	18.9	16 09	5 24	18.8	15 12	5 04	18.7	14 15	4 44	18.6	13 18	4 24	18.5	12 21	4 05	18.4	252	288
73	107	17 11	5 26	17.8	16 14	5 06	17.7	15 17	4 48	17.6	14 20	4 29	17.6	13 23	4 10	17.5	12 25	3 52	17.4	253	287
74	106	17 17	5 07	16.8	16 19	4 49	16.7	15 22	4 31	16.6	14 24	4 13	16.5	13 27	3 56	16.5	12 29	3 38	16.4	254	286
75	105	17 22	4 48	15.7	16 24	4 31	15.7	15 26	4 15	15.6	14 29	3 58	15.5	13 31	3 42	15.4	12 33	3 25	15.4	255	285
76	104	17 27	4 30	14.7	16 29	4 14	14.6	15 31	3 58	14.5	14 33	3 43	14.5	13 35	3 27	14.4	12 36	3 12	14.4	256	284
77	103	17 31	4 11	13.6	16 33	3 56	13.6	15 35	3 41	13.5	14 36	3 27	13.4	13 38	3 13	13.4	12 40	2 58	13.3	257	283
78	102	17 36	3 52	12.6	16 37	3 38	12.5	15 38	3 25	12.5	14 40	3 11	12.4	13 41	2 58	12.4	12 43	2 45	12.3	258	282
79	101	17 39	3 33	11.6	16 41	3 20	11.5	15 42	3 08	11.4	14 43	2 56	11.4	13 44	2 43	11.3	12 45	2 31	11.3	259	281
80	100	17 43	3 14	10.5	16 44	3 02	10.4	15 45	2 51	10.4	14 46	2 40	10.3	13 47	2 29	10.3	12 48	2 18	10.3	260	280
81	99	17 46	2 55	9.5	16 47	2 44	9.4	15 48	2 34	9.4	14 49	2 24	9.3	13 49	2 14	9.3	12 50	2 04	9.2	261	279
82	98	17 49	2 35	8.4	16 50	2 26	8.4	15 50	2 17	8.3	14 51	2 08	8.3	13 52	1 59	8.2	12 52	1 50	8.2	262	278
83	97	17 52	2 16	7.4	16 52	2 08	7.3	15 53	2 00	7.3	14 53	1 52	7.2	13 54	1 44	7.2	12 54	1 37	7.2	263	277
84	96	17 54	1 57	6.3	16 54	1 50	6.3	15 55	1 43	6.2	14 55	1 36	6.2	13 55	1 30	6.2	12 56	1 23	6.2	264	276
85	95	17 56	1 37	5.3	16 56	1 32	5.2	15 56	1 26	5.2	14 56	1 20	5.2	13 57	1 15	5.2	12 57	1 09	5.1	265	275
86	94	17 57	1 18	4.2	16 57	1 13	4.2	15 58	1 09	4.2	14 58	1 04	4.1	13 58	1 00	4.1	12 58	0 55	4.1	266	274
87	93	17 58	0 58	3.2	16 59	0 55	3.1	15 59	0 52	3.1	14 59	0 48	3.1	13 59	0 45	3.1	12 59	0 42	3.1	267	273
88	92	17 59	0 39	2.1	16 59	0 37	2.1	15 59	0 34	2.1	14 59	0 32	2.1	13 59	0 30	2.1	13 00	0 28	2.1	268	272
89	91	18 00	0 19	1.1	17 00	0 18	1.0	16 00	0 17	1.0	15 00	0 16	1.0	14 00	0 15	1.0	13 00	0 14	1.0	269	271
90	90	18 00	0 00	0.0	17 00	0 00	0.0	16 00	0 00	0.0	15 00	0 00	0.0	14 00	0 00	0.0	13 00	0 00	0.0	270	270

Lat. N.: para AHL > 180°... $Z_n = Z$
para AHL < 180°... $Z_n = 360° - Z$

Lat. S.: para AHL > 180°... $Z_n = 180° - Z$
para AHL < 180°... $Z_n = 180° + Z$

B : (–) para 90° < AHL < 270°
Dec : (–) para la Lat. con signo contrario

TABLA PARA REDUCCION DE VISUALES

Z_1 : mismo signo que B
Z_2 : (–) para F > 90°

Lat. / A		78°			79°			80°			81°			82°			83°			Lat. / A	
AHL / F		A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	AHL	
°	°	° ′	° ′	°	° ′	° ′	°	° ′	° ′	°	° ′	° ′	°	° ′	° ′	°	° ′	° ′	°	°	°
0	180	0 00	12 00	90.0	0 00	11 00	90.0	0 00	10 00	90.0	0 00	9 00	90.0	0 00	8 00	90.0	0 00	7 00	90.0	180	360
1	179	0 12	12 00	89.0	0 11	11 00	89.0	0 10	10 00	89.0	0 09	9 00	89.0	0 08	8 00	89.0	0 07	7 00	89.0	181	359
2	178	0 25	12 00	88.0	0 23	11 00	88.0	0 21	10 00	88.0	0 19	9 00	88.0	0 17	8 00	88.0	0 15	7 00	88.0	182	358
3	177	0 37	11 59	87.1	0 34	10 59	87.1	0 31	9 59	87.0	0 28	8 59	87.0	0 25	7 59	87.0	0 22	6 59	87.0	183	357
4	176	0 50	11 58	86.1	0 46	10 58	86.1	0 42	9 59	86.1	0 38	8 59	86.0	0 33	7 59	86.0	0 29	6 59	86.0	184	356
5	175	1 02	11 57	85.1	0 57	10 58	85.1	0 52	9 58	85.1	0 47	8 58	85.1	0 42	7 58	85.0	0 37	6 58	85.0	185	355
6	174	1 15	11 56	84.1	1 09	10 56	84.1	1 02	9 57	84.1	0 56	8 57	84.1	0 50	7 57	84.1	0 44	6 58	84.0	186	354
7	173	1 27	11 55	83.2	1 20	10 55	83.1	1 13	9 56	83.1	1 06	8 56	83.1	0 58	7 56	83.1	0 51	6 57	83.1	187	353
8	172	1 39	11 53	82.2	1 31	10 54	82.1	1 23	9 54	82.1	1 15	8 55	82.1	1 07	7 55	82.1	0 58	6 56	82.1	188	352
9	171	1 52	11 51	81.2	1 43	10 52	81.2	1 33	9 53	81.1	1 24	8 53	81.1	1 15	7 54	81.1	1 06	6 55	81.1	189	351
10	170	2 04	11 49	80.2	1 54	10 50	80.2	1 44	9 51	80.1	1 33	8 52	80.1	1 23	7 53	80.1	1 13	6 54	80.1	190	350
11	169	2 16	11 47	79.2	2 05	10 48	79.2	1 54	9 49	79.2	1 43	8 50	79.1	1 31	7 51	79.1	1 20	6 52	79.1	191	349
12	168	2 29	11 45	78.3	2 16	10 46	78.2	2 04	9 47	78.2	1 52	8 48	78.1	1 39	7 50	78.1	1 27	6 51	78.1	192	348
13	167	2 41	11 42	77.3	2 28	10 43	77.2	2 14	9 45	77.2	2 01	8 46	77.2	1 48	7 48	77.1	1 34	6 49	77.1	193	347
14	166	2 53	11 39	76.3	2 39	10 41	76.2	2 24	9 43	76.2	2 10	8 44	76.2	1 56	7 46	76.1	1 41	6 48	76.1	194	346
15	165	3 05	11 36	75.3	2 50	10 38	75.3	2 35	9 40	75.2	2 19	8 42	75.2	2 04	7 44	75.1	1 48	6 46	75.1	195	345
16	164	3 17	11 33	74.3	3 01	10 35	74.3	2 45	9 37	74.2	2 28	8 39	74.2	2 12	7 42	74.1	1 56	6 44	74.1	196	344
17	163	3 29	11 29	73.4	3 12	10 32	73.3	2 55	9 34	73.2	2 37	8 37	73.2	2 20	7 39	73.2	2 03	6 42	73.1	197	343
18	162	3 41	11 26	72.4	3 23	10 28	72.3	3 05	9 31	72.3	2 46	8 34	72.2	2 28	7 37	72.2	2 09	6 40	72.1	198	342
19	161	3 53	11 22	71.4	3 34	10 25	71.3	3 14	9 28	71.3	2 55	8 31	71.2	2 36	7 34	71.2	2 16	6 37	71.1	199	341
20	160	4 05	11 18	70.4	3 45	10 21	70.3	3 24	9 24	70.3	3 04	8 28	70.2	2 44	7 31	70.2	2 23	6 35	70.1	200	340
21	159	4 16	11 13	69.4	3 55	10 17	69.4	3 34	9 21	69.3	3 13	8 25	69.2	2 52	7 28	69.2	2 30	6 32	69.1	201	339
22	158	4 28	11 09	68.4	4 06	10 13	68.4	3 44	9 17	68.3	3 22	8 21	68.2	2 59	7 25	68.2	2 37	6 30	68.1	202	338
23	157	4 40	11 04	67.5	4 17	10 09	67.4	3 53	9 13	67.3	3 30	8 18	67.3	3 07	7 22	67.2	2 44	6 27	67.2	203	337
24	156	4 51	10 59	66.5	4 27	10 04	66.4	4 03	9 09	66.3	3 39	8 14	66.3	3 15	7 19	66.2	2 50	6 24	66.2	204	336
25	155	5 02	10 54	65.5	4 38	9 59	65.4	4 13	9 05	65.3	3 47	8 10	65.3	3 22	7 16	65.2	2 57	6 21	65.2	205	335
26	154	5 14	10 49	64.5	4 48	9 55	64.4	4 22	9 00	64.3	3 56	8 06	64.3	3 30	7 12	64.2	3 04	6 18	64.2	206	334
27	153	5 25	10 43	63.5	4 58	9 50	63.4	4 31	8 56	63.4	4 04	8 02	63.3	3 37	7 08	63.2	3 10	6 15	63.2	207	333
28	152	5 36	10 38	62.5	5 08	9 44	62.4	4 41	8 51	62.4	4 13	7 58	62.3	3 45	7 04	62.2	3 17	6 11	62.2	208	332
29	151	5 47	10 32	61.5	5 18	9 39	61.4	4 50	8 46	61.4	4 21	7 53	61.3	3 52	7 00	61.2	3 23	6 08	61.2	209	331
30	150	5 58	10 26	60.5	5 28	9 33	60.5	4 59	8 41	60.4	4 29	7 49	60.3	3 59	6 56	60.2	3 30	6 04	60.2	210	330
31	149	6 09	10 20	59.6	5 38	9 28	59.5	5 08	8 36	59.4	4 37	7 44	59.3	4 07	6 52	59.2	3 36	6 00	59.2	211	329
32	148	6 20	10 13	58.6	5 48	9 22	58.5	5 17	8 30	58.4	4 45	7 39	58.3	4 14	6 48	58.3	3 42	5 57	58.2	212	328
33	147	6 30	10 06	57.6	5 58	9 16	57.5	5 26	8 25	57.4	4 53	7 34	57.3	4 21	6 43	57.3	3 48	5 53	57.2	213	327
34	146	6 41	10 00	56.6	6 08	9 09	56.5	5 34	8 19	56.4	5 01	7 29	56.3	4 28	6 39	56.3	3 54	5 49	56.2	214	326
35	145	6 51	9 53	55.6	6 17	9 03	55.5	5 43	8 13	55.4	5 09	7 24	55.3	4 35	6 34	55.3	4 00	5 45	55.2	215	325
36	144	7 01	9 45	54.6	6 26	8 56	54.5	5 51	8 07	54.4	5 17	7 18	54.3	4 42	6 29	54.3	4 06	5 40	54.2	216	324
37	143	7 11	9 38	53.6	6 36	8 49	53.5	6 00	8 01	53.4	5 24	7 13	53.3	4 48	6 24	53.3	4 12	5 36	53.2	217	323
38	142	7 21	9 31	52.6	6 45	8 43	52.5	6 08	7 55	52.4	5 32	7 07	52.3	4 55	6 19	52.3	4 18	5 32	52.2	218	322
39	141	7 31	9 23	51.6	6 54	8 35	51.5	6 16	7 48	51.4	5 39	7 01	51.3	5 01	6 14	51.3	4 24	5 27	51.2	219	321
40	140	7 41	9 15	50.6	7 03	8 28	50.5	6 25	7 42	50.4	5 46	6 55	50.3	5 08	6 09	50.3	4 30	5 22	50.2	220	320
41	139	7 50	9 07	49.6	7 11	8 21	49.5	6 32	7 35	49.4	5 53	6 49	49.4	5 14	6 03	49.3	4 35	5 18	49.2	221	319
42	138	8 00	8 59	48.6	7 20	8 13	48.5	6 40	7 28	48.4	6 01	6 43	48.4	5 21	5 58	48.3	4 41	5 13	48.2	222	318
43	137	8 09	8 50	47.6	7 29	8 05	47.5	6 48	7 21	47.4	6 07	6 36	47.4	5 27	5 52	47.3	4 46	5 08	47.2	223	317
44	136	8 18	8 42	46.6	7 37	7 58	46.5	6 56	7 14	46.4	6 14	6 30	46.4	5 33	5 46	46.3	4 51	5 03	46.2	224	316
45	135	8 27	8 33	45.6	7 45	7 50	45.5	7 03	7 06	45.4	6 21	6 23	45.4	5 39	5 41	45.3	4 57	4 58	45.2	225	315

Lat. / A		84°			85°			86°			87°			88°			89°			Lat. / A	
AHL / F		A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	A / H	B / P	Z_1 / Z_2	AHL	
°	°	° ′	° ′	°	° ′	° ′	°	° ′	° ′	°	° ′	° ′	°	° ′	° ′	°	° ′	° ′	°	°	°
45	135	4 14	4 15	45.2	3 32	3 32	45.1	2 50	2 50	45.1	2 07	2 07	45.0	1 25	1 25	45.0	0 42	0 42	45.0	225	315
46	134	4 19	4 11	44.2	3 36	3 29	44.1	2 53	2 47	44.1	2 09	2 05	44.0	1 26	1 23	44.0	0 43	0 42	44.0	226	314
47	133	4 23	4 06	43.2	3 39	3 25	43.1	2 55	2 44	43.1	2 12	2 03	43.0	1 28	1 22	43.0	0 44	0 41	43.0	227	313
48	132	4 27	4 01	42.2	3 43	3 21	42.1	2 58	2 41	42.1	2 14	2 01	42.0	1 29	1 20	42.0	0 45	0 40	42.0	228	312
49	131	4 31	3 57	41.2	3 46	3 17	41.1	3 01	2 38	41.1	2 16	1 58	41.0	1 31	1 19	41.0	0 45	0 39	41.0	229	311
50	130	4 36	3 52	40.2	3 50	3 13	40.1	3 04	2 34	40.1	2 18	1 56	40.0	1 32	1 17	40.0	0 46	0 39	40.0	230	310
51	129	4 40	3 47	39.2	3 53	3 09	39.1	3 06	2 31	39.1	2 20	1 53	39.0	1 33	1 16	39.0	0 47	0 38	39.0	231	309
52	128	4 43	3 42	38.2	3 56	3 05	38.1	3 09	2 28	38.1	2 22	1 51	38.0	1 35	1 14	38.0	0 47	0 37	38.0	232	308
53	127	4 47	3 37	37.2	3 59	3 01	37.1	3 12	2 25	37.1	2 24	1 48	37.0	1 36	1 12	37.0	0 48	0 36	37.0	233	307
54	126	4 51	3 32	36.1	4 03	2 57	36.1	3 14	2 21	36.1	2 26	1 46	36.0	1 37	1 11	36.0	0 49	0 35	36.0	234	306
55	125	4 55	3 27	35.1	4 06	2 52	35.1	3 17	2 18	35.1	2 27	1 43	35.0	1 38	1 09	35.0	0 49	0 34	35.0	235	305
56	124	4 58	3 22	34.1	4 09	2 48	34.1	3 19	2 14	34.1	2 29	1 41	34.0	1 39	1 07	34.0	0 50	0 34	34.0	236	304
57	123	5 02	3 17	33.1	4 12	2 44	33.1	3 21	2 11	33.1	2 31	1 38	33.0	1 41	1 05	33.0	0 50	0 33	33.0	237	303
58	122	5 05	3 11	32.1	4 14	2 39	32.1	3 23	2 07	32.1	2 33	1 35	32.0	1 42	1 04	32.0	0 51	0 32	32.0	238	302
59	121	5 08	3 06	31.1	4 17	2 35	31.1	3 26	2 04	31.1	2 34	1 33	31.0	1 43	1 02	31.0	0 51	0 31	31.0	239	301
60	120	5 12	3 00	30.1	4 20	2 30	30.1	3 28	2 00	30.1	2 36	1 30	30.0	1 44	1 00	30.0	0 52	0 30	30.0	240	300
61	119	5 15	2 55	29.1	4 22	2 26	29.1	3 30	1 56	29.1	2 37	1 27	29.0	1 45	0 58	29.0	0 52	0 29	29.0	241	299
62	118	5 18	2 49	28.1	4 25	2 21	28.1	3 32	1 53	28.1	2 39	1 25	28.0	1 46	0 56	28.0	0 53	0 28	28.0	242	298
63	117	5 21	2 44	27.1	4 27	2 16	27.1	3 34	1 49	27.1	2 40	1 22	27.0	1 47	0 54	27.0	0 53	0 27	27.0	243	297
64	116	5 23	2 38	26.1	4 30	2 12	26.1	3 36	1 45	26.1	2 42	1 19	26.0	1 48	0 53	26.0	0 54	0 26	26.0	244	296
65	115	5 26	2 33	25.1	4 32	2 07	25.1	3 37	1 42	25.1	2 43	1 16	25.0	1 49	0 51	25.0	0 54	0 25	25.0	245	295
66	114	5 29	2 27	24.1	4 34	2 02	24.1	3 39	1 38	24.1	2 44	1 13	24.0	1 50	0 49	24.0	0 55	0 24	24.0	246	294
67	113	5 31	2 21	23.1	4 36	1 57	23.1	3 41	1 34	23.1	2 46	1 10	23.0	1 50	0 47	23.0	0 55	0 23	23.0	247	293
68	112	5 34	2 15	22.1	4 38	1 53	22.1	3 42	1 30	22.0	2 47	1 07	22.0	1 51	0 45	22.0	0 56	0 22	22.0	248	292
69	111	5 36	2 09	21.1	4 40	1 48	21.1	3 44	1 26	21.0	2 48	1 05	21.0	1 52	0 43	21.0	0 56	0 22	21.0	249	291
70	110	5 38	2 04	20.1	4 42	1 43	20.1	3 46	1 22	20.0	2 49	1 02	20.0	1 53	0 41	20.0	0 56	0 21	20.0	250	290
71	109	5 40	1 58	19.1	4 44	1 38	19.1	3 47	1 18	19.0	2 50	0 59	19.0	1 53	0 39	19.0	0 57	0 20	19.0	251	289
72	108	5 42	1 52	18.1	4 45	1 33	18.1	3 48	1 14	18.0	2 51	0 56	18.0	1 54	0 37	18.0	0 57	0 19	18.0	252	288
73	107	5 44	1 46	17.1	4 47	1 28	17.1	3 49	1 10	17.0	2 52	0 53	17.0	1 55	0 35	17.0	0 57	0 18	17.0	253	287
74	106	5 46	1 40	16.1	4 48	1 23	16.1	3 51	1 06	16.0	2 53	0 50	16.0	1 55	0 33	16.0	0 58	0 17	16.0	254	286
75	105	5 48	1 33	15.1	4 50	1 18	15.1	3 52	1 02	15.0	2 54	0 47	15.0	1 56	0 31	15.0	0 58	0 16	15.0	255	285
76	104	5 49	1 27	14.1	4 51	1 13	14.1	3 53	0 58	14.0	2 55	0 44	14.0	1 56	0 29	14.0	0 58	0 15	14.0	256	284
77	103	5 51	1 21	13.1	4 52	1 08	13.0	3 54	0 54	13.0	2 55	0 41	13.0	1 57	0 27	13.0	0 58	0 13	13.0	257	283
78	102	5 52	1 15	12.1	4 53	1 03	12.0	3 55	0 50	12.0	2 56	0 37	12.0	1 57	0 25	12.0	0 59	0 12	12.0	258	282
79	101	5 53	1 09	11.1	4 54	0 57	11.0	3 56	0 46	11.0	2 57	0 34	11.0	1 58	0 23	11.0	0 59	0 11	11.0	259	281
80	100	5 55	1 03	10.1	4 55	0 52	10.0	3 56	0 42	10.0	2 57	0 31	10.0	1 58	0 21	10.0	0 59	0 10	10.0	260	280
81	99	5 56	0 57	9.0	4 56	0 47	9.0	3 57	0 38	9.0	2 58	0 28	9.0	1 59	0 19	9.0	0 59	0 09	9.0	261	279
82	98	5 56	0 50	8.0	4 57	0 42	8.0	3 58	0 33	8.0	2 58	0 25	8.0	1 59	0 17	8.0	0 59	0 08	8.0	262	278
83	97	5 57	0 44	7.0	4 58	0 37	7.0	3 58	0 29	7.0	2 59	0 22	7.0	1 59	0 15	7.0	1 00	0 07	7.0	263	277
84	96	5 58	0 38	6.0	4 58	0 31	6.0	3 59	0 25	6.0	2 59	0 19	6.0	1 59	0 13	6.0	1 00	0 06	6.0	264	276
85	95	5 59	0 31	5.0	4 59	0 26	5.0	3 59	0 21	5.0	2 59	0 16	5.0	2 00	0 10	5.0	1 00	0 05	5.0	265	275
86	94	5 59	0 25	4.0	4 59	0 21	4.0	3 59	0 17	4.0	3 00	0 13	4.0	2 00	0 08	4.0	1 00	0 04	4.0	266	274
87	93	6 00	0 19	3.0	5 00	0 16	3.0	4 00	0 13	3.0	3 00	0 09	3.0	2 00	0 06	3.0	1 00	0 03	3.0	267	273
88	92	6 00	0 13	2.0	5 00	0 10	2.0	4 00	0 08	2.0	3 00	0 06	2.0	2 00	0 04	2.0	1 00	0 02	2.0	268	272
89	91	6 00	0 06	1.0	5 00	0 05	1.0	4 00	0 04	1.0	3 00	0 03	1.0	2 00	0 02	1.0	1 00	0 01	1.0	269	271
90	90	6 00	0 00	0.0	5 00	0 00	0.0	4 00	0 00	0.0	3 00	0 00	0.0	2 00	0 00	0.0	1 00	0 00	0.0	270	270

Lat. N.: para AHL > 180°... $Z_n = Z$
para AHL < 180°... $Z_n = 360° - Z$

Lat. S.: para AHL > 180°... $Z_n = 180° - Z$
para AHL < 180°... $Z_n = 180° + Z$

Signo de corr. 1 para F'. *Signo contrario si F > 90°*

TABLA AUXILIAR

Signo de corr. 2 para A'.

F' + −	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	□	− +A'
	59	58	57	56	55	54	53	52	51	50	49	48	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33	32	31	30	
P°	'	'	'	'	'	'	'	'	'	'	'	'	'	'	'	'	'	'	'	'	'	'	'	'	'	'	'	'	'	'	Z_2^c
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	89
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	88
3	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	87
4	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	86
5	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	3	3	85
6	0	0	0	0	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	3	3	3	3	3	3	3	84
7	0	0	0	0	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	3	3	3	3	3	3	3	3	4	4	83
8	0	0	0	1	1	1	1	1	1	1	2	2	2	2	2	2	2	3	3	3	3	3	3	3	3	4	4	4	4	4	82
9	0	0	0	1	1	1	1	1	1	2	2	2	2	2	2	3	3	3	3	3	3	3	4	4	4	4	4	4	5	5	81
10	0	0	1	1	1	1	1	1	2	2	2	2	2	2	3	3	3	3	3	3	4	4	4	4	4	5	5	5	5	5	80
11	0	0	1	1	1	1	1	2	2	2	2	2	2	3	3	3	3	3	4	4	4	4	4	5	5	5	5	5	6	6	79
12	0	0	1	1	1	1	1	2	2	2	2	2	3	3	3	3	4	4	4	4	4	5	5	5	5	5	6	6	6	6	78
13	0	0	1	1	1	1	2	2	2	2	2	3	3	3	3	4	4	4	4	4	5	5	5	5	6	6	6	6	7	7	77
14	0	0	1	1	1	1	2	2	2	2	3	3	3	3	4	4	4	4	5	5	5	5	6	6	6	6	7	7	7	7	76
15	0	1	1	1	1	2	2	2	2	3	3	3	3	4	4	4	4	5	5	5	5	6	6	6	6	7	7	7	8	8	75
16	0	1	1	1	1	2	2	2	2	3	3	3	4	4	4	4	5	5	5	6	6	6	6	7	7	7	7	8	8	8	74
17	0	1	1	1	1	2	2	2	3	3	3	4	4	4	4	5	5	5	6	6	6	6	7	7	7	8	8	8	8	9	73
18	0	1	1	1	2	2	2	2	3	3	3	4	4	4	5	5	5	6	6	6	6	7	7	7	8	8	8	9	9	9	72
19	0	1	1	1	2	2	2	3	3	3	4	4	4	5	5	5	6	6	6	7	7	7	7	8	8	8	9	9	9	10	71
20	0	1	1	1	2	2	2	3	3	3	4	4	4	5	5	5	6	6	6	7	7	8	8	8	9	9	9	10	10	10	70
21	0	1	1	1	2	2	3	3	3	4	4	4	5	5	5	6	6	6	7	7	8	8	8	9	9	9	10	10	10	11	69
22	0	1	1	1	2	2	3	3	3	4	4	4	5	5	6	6	6	7	7	7	8	8	9	9	9	10	10	10	11	11	68
23	0	1	1	2	2	2	3	3	4	4	4	5	5	5	6	6	7	7	7	8	8	9	9	9	10	10	11	11	11	12	67
24	0	1	1	2	2	2	3	3	4	4	4	5	5	6	6	7	7	7	8	8	9	9	9	10	10	11	11	11	12	12	66
25	0	1	1	2	2	3	3	3	4	4	5	5	5	6	6	7	7	8	8	8	9	9	10	10	11	11	11	12	12	13	65
26	0	1	1	2	2	3	3	4	4	4	5	5	6	6	7	7	7	8	8	9	9	10	10	11	11	11	12	12	13	13	64
27	0	1	1	2	2	3	3	4	4	5	5	5	6	6	7	7	8	8	9	9	10	10	10	11	11	12	12	13	13	14	63
28	0	1	1	2	2	3	3	4	4	5	5	6	6	7	7	8	8	8	9	9	10	10	11	11	12	12	13	13	14	14	62
29	0	1	1	2	2	3	3	4	4	5	5	6	6	7	7	8	8	9	9	10	10	11	11	12	12	13	13	14	14	15	61
30	1	1	2	2	3	3	4	4	5	5	6	6	7	7	8	8	9	9	10	10	11	11	12	12	13	13	14	14	15	15	60
31	1	1	2	2	3	3	4	4	5	5	6	6	7	7	8	8	9	9	10	10	11	11	12	12	13	13	14	14	15	15	59
32	1	1	2	2	3	3	4	4	5	5	6	6	7	7	8	8	9	10	10	11	11	12	12	13	13	14	14	15	15	16	58
33	1	1	2	2	3	3	4	4	5	5	6	7	7	8	8	9	9	10	10	11	11	12	13	13	14	14	15	15	16	16	57
34	1	1	2	2	3	3	4	4	5	6	6	7	7	8	8	9	10	10	11	11	12	12	13	13	14	15	15	16	16	17	56
35	1	1	2	2	3	3	4	5	5	6	6	7	7	8	9	9	10	10	11	11	12	13	13	14	14	15	15	16	17	17	55
36	1	1	2	2	3	4	4	5	5	6	6	7	8	8	9	9	10	11	11	12	12	13	14	14	15	15	16	16	17	18	54
37	1	1	2	2	3	4	4	5	5	6	7	7	8	8	9	10	10	11	11	12	13	13	14	14	15	16	16	17	17	18	53
38	1	1	2	2	3	4	4	5	6	6	7	7	8	9	9	10	10	11	12	12	13	14	14	15	15	16	17	17	18	18	52
39	1	1	2	3	3	4	4	5	6	6	7	8	8	9	9	10	11	11	12	13	13	14	14	15	16	16	17	18	18	19	51
40	1	1	2	3	3	4	4	5	6	6	7	8	8	9	10	10	11	12	12	13	13	14	15	15	16	17	17	18	19	19	50

F' + −	1 59	2 58	3 57	4 56	5 55	6 54	7 53	8 52	9 51	10 50	11 49	12 48	13 47	14 46	15 45	16 44	17 43	18 42	19 41	20 40	21 39	22 38	23 37	24 36	25 35	26 34	27 33	28 32	29 31	□ 30	− +A'
P°	'	'	'	'	'	'	'	'	'	'	'	'	'	'	'	'	'	'	'	'	'	'	'	'	'	'	'	'	'	'	$Z_2°$
41	1	1	2	3	3	4	5	5	6	7	7	8	9	9	10	10	11	12	12	13	14	14	15	16	16	17	18	18	19	20	49
42	1	1	2	3	3	4	5	5	6	7	7	8	9	9	10	11	11	12	13	13	14	15	15	16	17	17	18	19	19	20	48
43	1	1	2	3	3	4	5	5	6	7	8	8	9	10	10	11	12	12	13	14	14	15	16	16	17	18	18	19	20	20	47
44	1	1	2	3	3	4	5	6	6	7	8	8	9	10	10	11	12	13	13	14	15	15	16	17	17	18	19	19	20	21	46
45	1	1	2	3	4	4	5	6	6	7	8	8	9	10	11	11	12	13	13	14	15	16	16	17	18	18	19	20	21	21	45
46	1	1	2	3	4	4	5	6	6	7	8	9	9	10	11	12	12	13	14	14	15	16	17	17	18	19	19	20	21	22	44
47	1	1	2	3	4	4	5	6	7	7	8	9	10	10	11	12	12	13	14	15	15	16	17	18	18	19	20	20	21	22	43
48	1	1	2	3	4	4	5	6	7	7	8	9	10	10	11	12	13	13	14	15	16	16	17	18	19	19	20	21	22	22	42
49	1	2	2	3	4	5	5	6	7	8	8	9	10	11	11	12	13	14	14	15	16	17	17	18	19	20	20	21	22	23	41
50	1	2	2	3	4	5	5	6	7	8	8	9	10	11	11	12	13	14	15	15	16	17	18	18	19	20	21	21	22	23	40
51	1	2	2	3	4	5	5	6	7	8	9	9	10	11	12	12	13	14	15	16	16	17	18	19	19	20	21	22	23	23	39
52	1	2	2	3	4	5	6	6	7	8	9	9	10	11	12	13	13	14	15	16	17	17	18	19	20	20	21	22	23	24	38
53	1	2	2	3	4	5	6	6	7	8	9	10	10	11	12	13	14	14	15	16	17	18	18	19	20	21	22	22	23	24	37
54	1	2	2	3	4	5	6	6	7	8	9	10	11	11	12	13	14	15	15	16	17	18	19	19	20	21	22	23	23	24	36
55	1	2	2	3	4	5	6	7	7	8	9	10	11	11	12	13	14	15	16	16	17	18	19	20	20	21	22	23	24	25	35
56	1	2	2	3	4	5	6	7	7	8	9	10	11	12	12	13	14	15	16	17	17	18	19	20	21	22	22	23	24	25	34
57	1	2	3	3	4	5	6	7	8	8	9	10	11	12	13	13	14	15	16	17	18	18	19	20	21	22	23	23	24	25	33
58	1	2	3	3	4	5	6	7	8	8	9	10	11	12	13	14	14	15	16	17	18	19	20	20	21	22	23	24	25	25	32
59	1	2	3	3	4	5	6	7	8	9	9	10	11	12	13	14	15	15	16	17	18	19	20	21	21	22	23	24	25	26	31
60	1	2	3	3	4	5	6	7	8	9	10	10	11	12	13	14	15	16	16	17	18	19	20	21	22	23	23	24	25	26	30
61	1	2	3	3	4	5	6	7	8	9	10	10	11	12	13	14	15	16	17	17	18	19	20	21	22	23	24	24	25	26	29
62	1	2	3	4	4	5	6	7	8	9	10	11	11	12	13	14	15	16	17	18	19	19	20	21	22	23	24	25	26	26	28
63	1	2	3	4	4	5	6	7	8	9	10	11	12	12	13	14	15	16	17	18	19	20	20	21	22	23	24	25	26	27	27
64	1	2	3	4	4	5	6	7	8	9	10	11	12	13	13	14	15	16	17	18	19	20	21	22	22	23	24	25	26	27	26
65	1	2	3	4	5	5	6	7	8	9	10	11	12	13	14	15	15	16	17	18	19	20	21	22	23	24	24	25	26	27	25
66	1	2	3	4	5	5	6	7	8	9	10	11	12	13	14	15	16	16	17	18	19	20	21	22	23	24	25	26	26	27	24
67	1	2	3	4	5	6	6	7	8	9	10	11	12	13	14	15	16	17	17	18	19	20	21	22	23	24	25	26	27	28	23
68	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	24	25	26	27	28	22
69	1	2	3	4	5	6	7	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	21	22	23	24	25	26	27	28	21
70	1	2	3	4	5	6	7	8	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	23	24	25	26	27	28	20
71	1	2	3	4	5	6	7	8	9	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	26	27	28	19
72	1	2	3	4	5	6	7	8	9	10	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	18
73	1	2	3	4	5	6	7	8	9	10	11	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	17
74	1	2	3	4	5	6	7	8	9	10	11	12	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	16
75	1	2	3	4	5	6	7	8	9	10	11	12	13	14	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	15
76	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	16	17	18	19	20	21	22	23	24	25	26	27	28	29	14
77	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	19	20	21	22	23	24	25	26	27	28	29	13
78	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	22	23	24	25	26	27	28	29	12
79	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	27	28	29	11
80	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	10

Para P > 80°, usar 80°.

Para Z_2 < 10°, usar 10°

USO DE LAS TABLAS ABREVIADAS DE REDUCCIÓN DE VISUALES
(continuación)

4. *Ejemplo.* (b) Obtener la altura y el azimut de *Vega* el 29 de julio del 2001 a las $4^h\ 49^m$ T.U. de la posición estimada de 152° oeste y 15° sur.

1. Latitud asumida	$Lat =$	15° S	
Conforme al Almanaque	$AHG =$	100° 10′	
Longitud asumida		152° 10′ W	
Ángulo horario local	$AHL =$	308	
2. Primera entrada a la tabla de reducción			
$(Lat, AHL) = (15,308)$	$A =$	49 34	$A° = 50, A′ = 34$
	$B =$	+66 29	$Z_1 = +71.7,$ $AHL > 270°$
3. Conforme al Almanaque	$Dec =$	−38 47	*Lat* y *Dec* opuestas
Suma = $B + Dec$	$F =$	+27 42	$F° = 28, F′ = 42$
4. Segunda entrada a la tabla de reducción			
$(A°, F°) = (50, 28)$	$H =$	17 34	$P° = 37$
			$Z_2 = 67.8$
5. Primera entrada a la tabla auxiliar			
$(F′, P°) = (42, 37)$	$corr_1 =$	−11	$F < 90°, F′ > 29′$
Suma		17 23	
6. Segunda entrada a la tabla auxiliar			
$(A′, Z_2°) = (34, 68)$	$corr_2 =$	+10	$A′ > 30′$
7. Suma = Altura calculada	$H_c =$	+17° 33′	$F > 0°$
8. Azimut primer componente	$Z_1 =$	+71.7	mismo signo que B
segundo componente	$Z_2 =$	+67.8	$F < 90°, F > 0°$
Suma = ángulo azimutal	$Z =$	139.5	
Azimut verdadero	$Z_n =$	041°	*Lat* S, $AHL > 180°$

CONVERSION DE ARCO A TIEMPO

0°–59°		60°–119°		120°–179°		180°–239°		240°–299°		300°–359			0 ·00	0′·25	0′·50	0′·75
°	h m	°	h m	°	h m	°	h m	°	h m	°	h m	′	m s	m s	m s	m s
0	0 00	60	4 00	120	8 00	180	12 00	240	16 00	300	20 00	0	0 00	0 01	0 02	0 03
1	0 04	61	4 04	121	8 04	181	12 04	241	16 04	301	20 04	1	0 04	0 05	0 06	0 07
2	0 08	62	4 08	122	8 08	182	12 08	242	16 08	302	20 08	2	0 08	0 09	0 10	0 11
3	0 12	63	4 12	123	8 12	183	12 12	243	16 12	303	20 12	3	0 12	0 13	0 14	0 15
4	0 16	64	4 16	124	8 16	184	12 16	244	16 16	304	20 16	4	0 16	0 17	0 18	0 19
5	0 20	65	4 20	125	8 20	185	12 20	245	16 20	305	20 20	5	0 20	0 21	0 22	0 23
6	0 24	66	4 24	126	8 24	186	12 24	246	16 24	306	20 24	6	0 24	0 25	0 26	0 27
7	0 28	67	4 28	127	8 28	187	12 28	247	16 28	307	20 28	7	0 28	0 29	0 30	0 31
8	0 32	68	4 32	128	8 32	188	12 32	248	16 32	308	20 32	8	0 32	0 33	0 34	0 35
9	0 36	69	4 36	129	8 36	189	12 36	249	16 36	309	20 36	9	0 36	0 37	0 38	0 39
10	0 40	70	4 40	130	8 40	190	12 40	250	16 40	310	20 40	10	0 40	0 41	0 42	0 43
11	0 44	71	4 44	131	8 44	191	12 44	251	16 44	311	20 44	11	0 44	0 45	0 46	0 47
12	0 48	72	4 48	132	8 48	192	12 48	252	16 48	312	20 48	12	0 48	0 49	0 50	0 51
13	0 52	73	4 52	133	8 52	193	12 52	253	16 52	313	20 52	13	0 52	0 53	0 54	0 55
14	0 56	74	4 56	134	8 56	194	12 56	254	16 56	314	20 56	14	0 56	0 57	0 58	0 59
15	1 00	75	5 00	135	9 00	195	13 00	255	17 00	315	21 00	15	1 00	1 01	1 02	1 03
16	1 04	76	5 04	136	9 04	196	13 04	256	17 04	316	21 04	16	1 04	1 05	1 06	1 07
17	1 08	77	5 08	137	9 08	197	13 08	257	17 08	317	21 08	17	1 08	1 09	1 10	1 11
18	1 12	78	5 12	138	9 12	198	13 12	258	17 12	318	21 12	18	1 12	1 13	1 14	1 15
19	1 16	79	5 16	139	9 16	199	13 16	259	17 16	319	21 16	19	1 16	1 17	1 18	1 19
20	1 20	80	5 20	140	9 20	200	13 20	260	17 20	320	21 20	20	1 20	1 21	1 22	1 23
21	1 24	81	5 24	141	9 24	201	13 24	261	17 24	321	21 24	21	1 24	1 25	1 26	1 27
22	1 28	82	5 28	142	9 28	202	13 28	262	17 28	322	21 28	22	1 28	1 29	1 30	1 31
23	1 32	83	5 32	143	9 32	203	13 32	263	17 32	323	21 32	23	1 32	1 33	1 34	1 35
24	1 36	84	5 36	144	9 36	204	13 36	264	17 36	324	21 36	24	1 36	1 37	1 38	1 39
25	1 40	85	5 40	145	9 40	205	13 40	265	17 40	325	21 40	25	1 40	1 41	1 42	1 43
26	1 44	86	5 44	146	9 44	206	13 44	266	17 44	326	21 44	26	1 44	1 45	1 46	1 47
27	1 48	87	5 48	147	9 48	207	13 48	267	17 48	327	21 48	27	1 48	1 49	1 50	1 51
28	1 52	88	5 52	148	9 52	208	13 52	268	17 52	328	21 52	28	1 52	1 53	1 54	1 55
29	1 56	89	5 56	149	9 56	209	13 56	269	17 56	329	21 56	29	1 56	1 57	1 58	1 59
30	2 00	90	6 00	150	10 00	210	14 00	270	18 00	330	22 00	30	2 00	2 01	2 02	2 03
31	2 04	91	6 04	151	10 04	211	14 04	271	18 04	331	22 04	31	2 04	2 05	2 06	2 07
32	2 08	92	6 08	152	10 08	212	14 08	272	18 08	332	22 08	32	2 08	2 09	2 10	2 11
33	2 12	93	6 12	153	10 12	213	14 12	273	18 12	333	22 12	33	2 12	2 13	2 14	2 15
34	2 16	94	6 16	154	10 16	214	14 16	274	18 16	334	22 16	34	2 16	2 17	2 18	2 19
35	2 20	95	6 20	155	10 20	215	14 20	275	18 20	335	22 20	35	2 20	2 21	2 22	2 23
36	2 24	96	6 24	156	10 24	216	14 24	276	18 24	336	22 24	36	2 24	2 25	2 26	2 27
37	2 28	97	6 28	157	10 28	217	14 28	277	18 28	337	22 28	37	2 28	2 29	2 30	2 31
38	2 32	98	6 32	158	10 32	218	14 32	278	18 32	338	22 32	38	2 32	2 33	2 34	2 35
39	2 36	99	6 36	159	10 36	219	14 36	279	18 36	339	22 36	39	2 36	2 37	2 38	2 39
40	2 40	100	6 40	160	10 40	220	14 40	280	18 40	340	22 40	40	2 40	2 41	2 42	2 43
41	2 44	101	6 44	161	10 44	221	14 44	281	18 44	341	22 44	41	2 44	2 45	2 46	2 47
42	2 48	102	6 48	162	10 48	222	14 48	282	18 48	342	22 48	42	2 48	2 49	2 50	2 51
43	2 52	103	6 52	163	10 52	223	14 52	283	18 52	343	22 52	43	2 52	2 53	2 54	2 55
44	2 56	104	6 56	164	10 56	224	14 56	284	18 56	344	22 56	44	2 56	2 57	2 58	2 59
45	3 00	105	7 00	165	11 00	225	15 00	285	19 00	345	23 00	45	3 00	3 01	3 02	3 03
46	3 04	106	7 04	166	11 04	226	15 04	286	19 04	346	23 04	46	3 04	3 05	3 06	3 07
47	3 08	107	7 08	167	11 08	227	15 08	287	19 08	347	23 08	47	3 08	3 09	3 10	3 11
48	3 12	108	7 12	168	11 12	228	15 12	288	19 12	348	23 12	48	3 12	3 13	3 14	3 15
49	3 16	109	7 16	169	11 16	229	15 16	289	19 16	349	23 16	49	3 16	3 17	3 18	3 19
50	3 20	110	7 20	170	11 20	230	15 20	290	19 20	350	23 20	50	3 20	3 21	3 22	3 23
51	3 24	111	7 24	171	11 24	231	15 24	291	19 24	351	23 24	51	3 24	3 25	3 26	3 27
52	3 28	112	7 28	172	11 28	232	15 28	292	19 28	352	23 28	52	3 28	3 29	3 30	3 31
53	3 32	113	7 32	173	11 32	233	15 32	293	19 32	353	23 32	53	3 32	3 33	3 34	3 35
54	3 36	114	7 36	174	11 36	234	15 36	294	19 36	354	23 36	54	3 36	3 37	3 38	3 39
55	3 40	115	7 40	175	11 40	235	15 40	295	19 40	355	23 40	55	3 40	3 41	3 42	3 43
56	3 44	116	7 44	176	11 44	236	15 44	296	19 44	356	23 44	56	3 44	3 45	3 46	3 47
57	3 48	117	7 48	177	11 48	237	15 48	297	19 48	357	23 48	57	3 48	3 49	3 50	3 51
58	3 52	118	7 52	178	11 52	238	15 52	298	19 52	358	23 52	58	3 52	3 53	3 54	3 55
59	3 56	119	7 56	179	11 56	239	15 56	299	19 56	359	23 56	59	3 56	3 57	3 58	3 59

La tabla anterior se usa para convertir expresiones en arco a sus equivalentes en tiempo; su uso principal en este Almanaque es para la conversión de valores de la longitud para aplicarse a T.M.L. (*sumadas* al *oeste*, *restadas* al *este)* para obtener T.U. o viceversa, particularmente en el caso del orto y ocaso del Sol, etc.

m 0	SOL PLANETAS	ARIES	LUNA	v o d	Corrn	v o d	Corrn	v o d	Corrn
s	° ′	° ′	° ′	′	′	′	′	′	′
00	0 00·0	0 00·0	0 00·0	0·0	0·0	6·0	0·1	12·0	0·1
01	0 00·3	0 00·3	0 00·2	0·1	0·0	6·1	0·1	12·1	0·1
02	0 00·5	0 00·5	0 00·5	0·2	0·0	6·2	0·1	12·2	0·1
03	0 00·8	0 00·8	0 00·7	0·3	0·0	6·3	0·1	12·3	0·1
04	0 01·0	0 01·0	0 01·0	0·4	0·0	6·4	0·1	12·4	0·1
05	0 01·3	0 01·3	0 01·2	0·5	0·0	6·5	0·1	12·5	0·1
06	0 01·5	0 01·5	0 01·4	0·6	0·0	6·6	0·1	12·6	0·1
07	0 01·8	0 01·8	0 01·7	0·7	0·0	6·7	0·1	12·7	0·1
08	0 02·0	0 02·0	0 01·9	0·8	0·0	6·8	0·1	12·8	0·1
09	0 02·3	0 02·3	0 02·1	0·9	0·0	6·9	0·1	12·9	0·1
10	0 02·5	0 02·5	0 02·4	1·0	0·0	7·0	0·1	13·0	0·1
11	0 02·8	0 02·8	0 02·6	1·1	0·0	7·1	0·1	13·1	0·1
12	0 03·0	0 03·0	0 02·9	1·2	0·0	7·2	0·1	13·2	0·1
13	0 03·3	0 03·3	0 03·1	1·3	0·0	7·3	0·1	13·3	0·1
14	0 03·5	0 03·5	0 03·3	1·4	0·0	7·4	0·1	13·4	0·1
15	0 03·8	0 03·8	0 03·6	1·5	0·0	7·5	0·1	13·5	0·1
16	0 04·0	0 04·0	0 03·8	1·6	0·0	7·6	0·1	13·6	0·1
17	0 04·3	0 04·3	0 04·1	1·7	0·0	7·7	0·1	13·7	0·1
18	0 04·5	0 04·5	0 04·3	1·8	0·0	7·8	0·1	13·8	0·1
19	0 04·8	0 04·8	0 04·5	1·9	0·0	7·9	0·1	13·9	0·1
20	0 05·0	0 05·0	0 04·8	2·0	0·0	8·0	0·1	14·0	0·1
21	0 05·3	0 05·3	0 05·0	2·1	0·0	8·1	0·1	14·1	0·1
22	0 05·5	0 05·5	0 05·2	2·2	0·0	8·2	0·1	14·2	0·1
23	0 05·8	0 05·8	0 05·5	2·3	0·0	8·3	0·1	14·3	0·1
24	0 06·0	0 06·0	0 05·7	2·4	0·0	8·4	0·1	14·4	0·1
25	0 06·3	0 06·3	0 06·0	2·5	0·0	8·5	0·1	14·5	0·1
26	0 06·5	0 06·5	0 06·2	2·6	0·0	8·6	0·1	14·6	0·1
27	0 06·8	0 06·8	0 06·4	2·7	0·0	8·7	0·1	14·7	0·1
28	0 07·0	0 07·0	0 06·7	2·8	0·0	8·8	0·1	14·8	0·1
29	0 07·3	0 07·3	0 06·9	2·9	0·0	8·9	0·1	14·9	0·1
30	0 07·5	0 07·5	0 07·2	3·0	0·0	9·0	0·1	15·0	0·1
31	0 07·8	0 07·8	0 07·4	3·1	0·0	9·1	0·1	15·1	0·1
32	0 08·0	0 08·0	0 07·6	3·2	0·0	9·2	0·1	15·2	0·1
33	0 08·3	0 08·3	0 07·9	3·3	0·0	9·3	0·1	15·3	0·1
34	0 08·5	0 08·5	0 08·1	3·4	0·0	9·4	0·1	15·4	0·1
35	0 08·8	0 08·8	0 08·4	3·5	0·0	9·5	0·1	15·5	0·1
36	0 09·0	0 09·0	0 08·6	3·6	0·0	9·6	0·1	15·6	0·1
37	0 09·3	0 09·3	0 08·8	3·7	0·0	9·7	0·1	15·7	0·1
38	0 09·5	0 09·5	0 09·1	3·8	0·0	9·8	0·1	15·8	0·1
39	0 09·8	0 09·8	0 09·3	3·9	0·0	9·9	0·1	15·9	0·1
40	0 10·0	0 10·0	0 09·5	4·0	0·0	10·0	0·1	16·0	0·1
41	0 10·3	0 10·3	0 09·8	4·1	0·0	10·1	0·1	16·1	0·1
42	0 10·5	0 10·5	0 10·0	4·2	0·0	10·2	0·1	16·2	0·1
43	0 10·8	0 10·8	0 10·3	4·3	0·0	10·3	0·1	16·3	0·1
44	0 11·0	0 11·0	0 10·5	4·4	0·0	10·4	0·1	16·4	0·1
45	0 11·3	0 11·3	0 10·7	4·5	0·0	10·5	0·1	16·5	0·1
46	0 11·5	0 11·5	0 11·0	4·6	0·0	10·6	0·1	16·6	0·1
47	0 11·8	0 11·8	0 11·2	4·7	0·0	10·7	0·1	16·7	0·1
48	0 12·0	0 12·0	0 11·5	4·8	0·0	10·8	0·1	16·8	0·1
49	0 12·3	0 12·3	0 11·7	4·9	0·0	10·9	0·1	16·9	0·1
50	0 12·5	0 12·5	0 11·9	5·0	0·0	11·0	0·1	17·0	0·1
51	0 12·8	0 12·8	0 12·2	5·1	0·0	11·1	0·1	17·1	0·1
52	0 13·0	0 13·0	0 12·4	5·2	0·0	11·2	0·1	17·2	0·1
53	0 13·3	0 13·3	0 12·6	5·3	0·0	11·3	0·1	17·3	0·1
54	0 13·5	0 13·5	0 12·9	5·4	0·0	11·4	0·1	17·4	0·1
55	0 13·8	0 13·8	0 13·1	5·5	0·0	11·5	0·1	17·5	0·1
56	0 14·0	0 14·0	0 13·4	5·6	0·0	11·6	0·1	17·6	0·1
57	0 14·3	0 14·3	0 13·6	5·7	0·0	11·7	0·1	17·7	0·1
58	0 14·5	0 14·5	0 13·8	5·8	0·0	11·8	0·1	17·8	0·1
59	0 14·8	0 14·8	0 14·1	5·9	0·0	11·9	0·1	17·9	0·1
60	0 15·0	0 15·0	0 14·3	6·0	0·1	12·0	0·1	18·0	0·2

m 1	SOL PLANETAS	ARIES	LUNA	v o d	Corrn	v o d	Corrn	v o d	Corrn
s	° ′	° ′	° ′	′	′	′	′	′	′
00	0 15·0	0 15·0	0 14·3	0·0	0·0	6·0	0·2	12·0	0·3
01	0 15·3	0 15·3	0 14·6	0·1	0·0	6·1	0·2	12·1	0·3
02	0 15·5	0 15·5	0 14·8	0·2	0·0	6·2	0·2	12·2	0·3
03	0 15·8	0 15·8	0 15·0	0·3	0·0	6·3	0·2	12·3	0·3
04	0 16·0	0 16·0	0 15·3	0·4	0·0	6·4	0·2	12·4	0·3
05	0 16·3	0 16·3	0 15·5	0·5	0·0	6·5	0·2	12·5	0·3
06	0 16·5	0 16·5	0 15·7	0·6	0·0	6·6	0·2	12·6	0·3
07	0 16·8	0 16·8	0 16·0	0·7	0·0	6·7	0·2	12·7	0·3
08	0 17·0	0 17·0	0 16·2	0·8	0·0	6·8	0·2	12·8	0·3
09	0 17·3	0 17·3	0 16·5	0·9	0·0	6·9	0·2	12·9	0·3
10	0 17·5	0 17·5	0 16·7	1·0	0·0	7·0	0·2	13·0	0·3
11	0 17·8	0 17·8	0 16·9	1·1	0·0	7·1	0·2	13·1	0·3
12	0 18·0	0 18·0	0 17·2	1·2	0·0	7·2	0·2	13·2	0·3
13	0 18·3	0 18·3	0 17·4	1·3	0·0	7·3	0·2	13·3	0·3
14	0 18·5	0 18·6	0 17·7	1·4	0·0	7·4	0·2	13·4	0·3
15	0 18·8	0 18·8	0 17·9	1·5	0·0	7·5	0·2	13·5	0·3
16	0 19·0	0 19·1	0 18·1	1·6	0·0	7·6	0·2	13·6	0·3
17	0 19·3	0 19·3	0 18·4	1·7	0·0	7·7	0·2	13·7	0·3
18	0 19·5	0 19·6	0 18·6	1·8	0·0	7·8	0·2	13·8	0·3
19	0 19·8	0 19·8	0 18·9	1·9	0·0	7·9	0·2	13·9	0·3
20	0 20·0	0 20·1	0 19·1	2·0	0·1	8·0	0·2	14·0	0·4
21	0 20·3	0 20·3	0 19·3	2·1	0·1	8·1	0·2	14·1	0·4
22	0 20·5	0 20·6	0 19·6	2·2	0·1	8·2	0·2	14·2	0·4
23	0 20·8	0 20·8	0 19·8	2·3	0·1	8·3	0·2	14·3	0·4
24	0 21·0	0 21·1	0 20·0	2·4	0·1	8·4	0·2	14·4	0·4
25	0 21·3	0 21·3	0 20·3	2·5	0·1	8·5	0·2	14·5	0·4
26	0 21·5	0 21·6	0 20·5	2·6	0·1	8·6	0·2	14·6	0·4
27	0 21·8	0 21·8	0 20·8	2·7	0·1	8·7	0·2	14·7	0·4
28	0 22·0	0 22·1	0 21·0	2·8	0·1	8·8	0·2	14·8	0·4
29	0 22·3	0 22·3	0 21·2	2·9	0·1	8·9	0·2	14·9	0·4
30	0 22·5	0 22·6	0 21·5	3·0	0·1	9·0	0·2	15·0	0·4
31	0 22·8	0 22·8	0 21·7	3·1	0·1	9·1	0·2	15·1	0·4
32	0 23·0	0 23·1	0 22·0	3·2	0·1	9·2	0·2	15·2	0·4
33	0 23·3	0 23·3	0 22·2	3·3	0·1	9·3	0·2	15·3	0·4
34	0 23·5	0 23·6	0 22·4	3·4	0·1	9·4	0·2	15·4	0·4
35	0 23·8	0 23·8	0 22·7	3·5	0·1	9·5	0·2	15·5	0·4
36	0 24·0	0 24·1	0 22·9	3·6	0·1	9·6	0·2	15·6	0·4
37	0 24·3	0 24·3	0 23·1	3·7	0·1	9·7	0·2	15·7	0·4
38	0 24·5	0 24·6	0 23·4	3·8	0·1	9·8	0·2	15·8	0·4
39	0 24·8	0 24·8	0 23·6	3·9	0·1	9·9	0·2	15·9	0·4
40	0 25·0	0 25·1	0 23·9	4·0	0·1	10·0	0·3	16·0	0·4
41	0 25·3	0 25·3	0 24·1	4·1	0·1	10·1	0·3	16·1	0·4
42	0 25·5	0 25·6	0 24·3	4·2	0·1	10·2	0·3	16·2	0·4
43	0 25·8	0 25·8	0 24·6	4·3	0·1	10·3	0·3	16·3	0·4
44	0 26·0	0 26·1	0 24·8	4·4	0·1	10·4	0·3	16·4	0·4
45	0 26·3	0 26·3	0 25·1	4·5	0·1	10·5	0·3	16·5	0·4
46	0 26·5	0 26·6	0 25·3	4·6	0·1	10·6	0·3	16·6	0·4
47	0 26·8	0 26·8	0 25·5	4·7	0·1	10·7	0·3	16·7	0·4
48	0 27·0	0 27·1	0 25·8	4·8	0·1	10·8	0·3	16·8	0·4
49	0 27·3	0 27·3	0 26·0	4·9	0·1	10·9	0·3	16·9	0·4
50	0 27·5	0 27·6	0 26·2	5·0	0·1	11·0	0·3	17·0	0·4
51	0 27·8	0 27·8	0 26·5	5·1	0·1	11·1	0·3	17·1	0·4
52	0 28·0	0 28·1	0 26·7	5·2	0·1	11·2	0·3	17·2	0·4
53	0 28·3	0 28·3	0 27·0	5·3	0·1	11·3	0·3	17·3	0·4
54	0 28·5	0 28·6	0 27·2	5·4	0·1	11·4	0·3	17·4	0·4
55	0 28·8	0 28·8	0 27·4	5·5	0·1	11·5	0·3	17·5	0·4
56	0 29·0	0 29·1	0 27·7	5·6	0·1	11·6	0·3	17·6	0·4
57	0 29·3	0 29·3	0 27·9	5·7	0·1	11·7	0·3	17·7	0·4
58	0 29·5	0 29·6	0 28·2	5·8	0·1	11·8	0·3	17·8	0·4
59	0 29·8	0 29·8	0 28·4	5·9	0·1	11·9	0·3	17·9	0·4
60	0 30·0	0 30·1	0 28·6	6·0	0·2	12·0	0·3	18·0	0·5

2m s	SOL PLANETAS ° ′	ARIES ° ′	LUNA ° ′	v o d	Corrn	v o d	Corrn	v o d	Corrn
				′	′	′	′	′	′
00	0 30·0	0 30·1	0 28·6	0·0	0·0	6·0	0·3	12·0	0·5
01	0 30·3	0 30·3	0 28·9	0·1	0·0	6·1	0·3	12·1	0·5
02	0 30·5	0 30·6	0 29·1	0·2	0·0	6·2	0·3	12·2	0·5
03	0 30·8	0 30·8	0 29·3	0·3	0·0	6·3	0·3	12·3	0·5
04	0 31·0	0 31·1	0 29·6	0·4	0·0	6·4	0·3	12·4	0·5
05	0 31·3	0 31·3	0 29·8	0·5	0·0	6·5	0·3	12·5	0·5
06	0 31·5	0 31·6	0 30·1	0·6	0·0	6·6	0·3	12·6	0·5
07	0 31·8	0 31·8	0 30·3	0·7	0·0	6·7	0·3	12·7	0·5
08	0 32·0	0 32·1	0 30·5	0·8	0·0	6·8	0·3	12·8	0·5
09	0 32·3	0 32·3	0 30·8	0·9	0·0	6·9	0·3	12·9	0·5
10	0 32·5	0 32·6	0 31·0	1·0	0·0	7·0	0·3	13·0	0·5
11	0 32·8	0 32·8	0 31·3	1·1	0·0	7·1	0·3	13·1	0·5
12	0 33·0	0 33·1	0 31·5	1·2	0·1	7·2	0·3	13·2	0·6
13	0 33·3	0 33·3	0 31·7	1·3	0·1	7·3	0·3	13·3	0·6
14	0 33·5	0 33·6	0 32·0	1·4	0·1	7·4	0·3	13·4	0·6
15	0 33·8	0 33·8	0 32·2	1·5	0·1	7·5	0·3	13·5	0·6
16	0 34·0	0 34·1	0 32·5	1·6	0·1	7·6	0·3	13·6	0·6
17	0 34·3	0 34·3	0 32·7	1·7	0·1	7·7	0·3	13·7	0·6
18	0 34·5	0 34·6	0 32·9	1·8	0·1	7·8	0·3	13·8	0·6
19	0 34·8	0 34·8	0 33·2	1·9	0·1	7·9	0·3	13·9	0·6
20	0 35·0	0 35·1	0 33·4	2·0	0·1	8·0	0·3	14·0	0·6
21	0 35·3	0 35·3	0 33·6	2·1	0·1	8·1	0·3	14·1	0·6
22	0 35·5	0 35·6	0 33·9	2·2	0·1	8·2	0·3	14·2	0·6
23	0 35·8	0 35·8	0 34·1	2·3	0·1	8·3	0·3	14·3	0·6
24	0 36·0	0 36·1	0 34·4	2·4	0·1	8·4	0·4	14·4	0·6
25	0 36·3	0 36·3	0 34·6	2·5	0·1	8·5	0·4	14·5	0·6
26	0 36·5	0 36·6	0 34·8	2·6	0·1	8·6	0·4	14·6	0·6
27	0 36·8	0 36·9	0 35·1	2·7	0·1	8·7	0·4	14·7	0·6
28	0 37·0	0 37·1	0 35·3	2·8	0·1	8·8	0·4	14·8	0·6
29	0 37·3	0 37·4	0 35·6	2·9	0·1	8·9	0·4	14·9	0·6
30	0 37·5	0 37·6	0 35·8	3·0	0·1	9·0	0·4	15·0	0·6
31	0 37·8	0 37·9	0 36·0	3·1	0·1	9·1	0·4	15·1	0·6
32	0 38·0	0 38·1	0 36·3	3·2	0·1	9·2	0·4	15·2	0·6
33	0 38·3	0 38·4	0 36·5	3·3	0·1	9·3	0·4	15·3	0·6
34	0 38·5	0 38·6	0 36·7	3·4	0·1	9·4	0·4	15·4	0·6
35	0 38·8	0 38·9	0 37·0	3·5	0·1	9·5	0·4	15·5	0·6
36	0 39·0	0 39·1	0 37·2	3·6	0·2	9·6	0·4	15·6	0·7
37	0 39·3	0 39·4	0 37·5	3·7	0·2	9·7	0·4	15·7	0·7
38	0 39·5	0 39·6	0 37·7	3·8	0·2	9·8	0·4	15·8	0·7
39	0 39·8	0 39·9	0 37·9	3·9	0·2	9·9	0·4	15·9	0·7
40	0 40·0	0 40·1	0 38·2	4·0	0·2	10·0	0·4	16·0	0·7
41	0 40·3	0 40·4	0 38·4	4·1	0·2	10·1	0·4	16·1	0·7
42	0 40·5	0 40·6	0 38·7	4·2	0·2	10·2	0·4	16·2	0·7
43	0 40·8	0 40·9	0 38·9	4·3	0·2	10·3	0·4	16·3	0·7
44	0 41·0	0 41·1	0 39·1	4·4	0·2	10·4	0·4	16·4	0·7
45	0 41·3	0 41·4	0 39·4	4·5	0·2	10·5	0·4	16·5	0·7
46	0 41·5	0 41·6	0 39·6	4·6	0·2	10·6	0·4	16·6	0·7
47	0 41·8	0 41·9	0 39·8	4·7	0·2	10·7	0·4	16·7	0·7
48	0 42·0	0 42·1	0 40·1	4·8	0·2	10·8	0·5	16·8	0·7
49	0 42·3	0 42·4	0 40·3	4·9	0·2	10·9	0·5	16·9	0·7
50	0 42·5	0 42·6	0 40·6	5·0	0·2	11·0	0·5	17·0	0·7
51	0 42·8	0 42·9	0 40·8	5·1	0·2	11·1	0·5	17·1	0·7
52	0 43·0	0 43·1	0 41·0	5·2	0·2	11·2	0·5	17·2	0·7
53	0 43·3	0 43·4	0 41·3	5·3	0·2	11·3	0·5	17·3	0·7
54	0 43·5	0 43·6	0 41·5	5·4	0·2	11·4	0·5	17·4	0·7
55	0 43·8	0 43·9	0 41·8	5·5	0·2	11·5	0·5	17·5	0·7
56	0 44·0	0 44·1	0 42·0	5·6	0·2	11·6	0·5	17·6	0·7
57	0 44·3	0 44·4	0 42·2	5·7	0·2	11·7	0·5	17·7	0·7
58	0 44·5	0 44·6	0 42·5	5·8	0·2	11·8	0·5	17·8	0·7
59	0 44·8	0 44·9	0 42·7	5·9	0·2	11·9	0·5	17·9	0·7
60	0 45·0	0 45·1	0 43·0	6·0	0·3	12·0	0·5	18·0	0·8

3m s	SOL PLANETAS ° ′	ARIES ° ′	LUNA ° ′	v o d	Corrn	v o d	Corrn	v o d	Corrn
				′	′	′	′	′	′
00	0 45·0	0 45·1	0 43·0	0·0	0·0	6·0	0·4	12·0	0·7
01	0 45·3	0 45·4	0 43·2	0·1	0·0	6·1	0·4	12·1	0·7
02	0 45·5	0 45·6	0 43·4	0·2	0·0	6·2	0·4	12·2	0·7
03	0 45·8	0 45·9	0 43·7	0·3	0·0	6·3	0·4	12·3	0·7
04	0 46·0	0 46·1	0 43·9	0·4	0·0	6·4	0·4	12·4	0·7
05	0 46·3	0 46·4	0 44·1	0·5	0·0	6·5	0·4	12·5	0·7
06	0 46·5	0 46·6	0 44·4	0·6	0·0	6·6	0·4	12·6	0·7
07	0 46·8	0 46·9	0 44·6	0·7	0·0	6·7	0·4	12·7	0·7
08	0 47·0	0 47·1	0 44·9	0·8	0·0	6·8	0·4	12·8	0·7
09	0 47·3	0 47·4	0 45·1	0·9	0·1	6·9	0·4	12·9	0·8
10	0 47·5	0 47·6	0 45·3	1·0	0·1	7·0	0·4	13·0	0·8
11	0 47·8	0 47·9	0 45·6	1·1	0·1	7·1	0·4	13·1	0·8
12	0 48·0	0 48·1	0 45·8	1·2	0·1	7·2	0·4	13·2	0·8
13	0 48·3	0 48·4	0 46·1	1·3	0·1	7·3	0·4	13·3	0·8
14	0 48·5	0 48·6	0 46·3	1·4	0·1	7·4	0·4	13·4	0·8
15	0 48·8	0 48·9	0 46·5	1·5	0·1	7·5	0·4	13·5	0·8
16	0 49·0	0 49·1	0 46·8	1·6	0·1	7·6	0·4	13·6	0·8
17	0 49·3	0 49·4	0 47·0	1·7	0·1	7·7	0·4	13·7	0·8
18	0 49·5	0 49·6	0 47·2	1·8	0·1	7·8	0·5	13·8	0·8
19	0 49·8	0 49·9	0 47·5	1·9	0·1	7·9	0·5	13·9	0·8
20	0 50·0	0 50·1	0 47·7	2·0	0·1	8·0	0·5	14·0	0·8
21	0 50·3	0 50·4	0 48·0	2·1	0·1	8·1	0·5	14·1	0·8
22	0 50·5	0 50·6	0 48·2	2·2	0·1	8·2	0·5	14·2	0·8
23	0 50·8	0 50·9	0 48·4	2·3	0·1	8·3	0·5	14·3	0·8
24	0 51·0	0 51·1	0 48·7	2·4	0·1	8·4	0·5	14·4	0·8
25	0 51·3	0 51·4	0 48·9	2·5	0·1	8·5	0·5	14·5	0·8
26	0 51·5	0 51·6	0 49·2	2·6	0·2	8·6	0·5	14·6	0·9
27	0 51·8	0 51·9	0 49·4	2·7	0·2	8·7	0·5	14·7	0·9
28	0 52·0	0 52·1	0 49·6	2·8	0·2	8·8	0·5	14·8	0·9
29	0 52·3	0 52·4	0 49·9	2·9	0·2	8·9	0·5	14·9	0·9
30	0 52·5	0 52·6	0 50·1	3·0	0·2	9·0	0·5	15·0	0·9
31	0 52·8	0 52·9	0 50·3	3·1	0·2	9·1	0·5	15·1	0·9
32	0 53·0	0 53·1	0 50·6	3·2	0·2	9·2	0·5	15·2	0·9
33	0 53·3	0 53·4	0 50·8	3·3	0·2	9·3	0·5	15·3	0·9
34	0 53·5	0 53·6	0 51·1	3·4	0·2	9·4	0·5	15·4	0·9
35	0 53·8	0 53·9	0 51·3	3·5	0·2	9·5	0·6	15·5	0·9
36	0 54·0	0 54·1	0 51·5	3·6	0·2	9·6	0·6	15·6	0·9
37	0 54·3	0 54·4	0 51·8	3·7	0·2	9·7	0·6	15·7	0·9
38	0 54·5	0 54·6	0 52·0	3·8	0·2	9·8	0·6	15·8	0·9
39	0 54·8	0 54·9	0 52·3	3·9	0·2	9·9	0·6	15·9	0·9
40	0 55·0	0 55·2	0 52·5	4·0	0·2	10·0	0·6	16·0	0·9
41	0 55·3	0 55·4	0 52·7	4·1	0·2	10·1	0·6	16·1	0·9
42	0 55·5	0 55·7	0 53·0	4·2	0·2	10·2	0·6	16·2	0·9
43	0 55·8	0 55·9	0 53·2	4·3	0·3	10·3	0·6	16·3	1·0
44	0 56·0	0 56·2	0 53·4	4·4	0·3	10·4	0·6	16·4	1·0
45	0 56·3	0 56·4	0 53·7	4·5	0·3	10·5	0·6	16·5	1·0
46	0 56·5	0 56·7	0 53·9	4·6	0·3	10·6	0·6	16·6	1·0
47	0 56·8	0 56·9	0 54·2	4·7	0·3	10·7	0·6	16·7	1·0
48	0 57·0	0 57·2	0 54·4	4·8	0·3	10·8	0·6	16·8	1·0
49	0 57·3	0 57·4	0 54·6	4·9	0·3	10·9	0·6	16·9	1·0
50	0 57·5	0 57·7	0 54·9	5·0	0·3	11·0	0·6	17·0	1·0
51	0 57·8	0 57·9	0 55·1	5·1	0·3	11·1	0·6	17·1	1·0
52	0 58·0	0 58·2	0 55·4	5·2	0·3	11·2	0·7	17·2	1·0
53	0 58·3	0 58·4	0 55·6	5·3	0·3	11·3	0·7	17·3	1·0
54	0 58·5	0 58·7	0 55·8	5·4	0·3	11·4	0·7	17·4	1·0
55	0 58·8	0 58·9	0 56·1	5·5	0·3	11·5	0·7	17·5	1·0
56	0 59·0	0 59·2	0 56·3	5·6	0·3	11·6	0·7	17·6	1·0
57	0 59·3	0 59·4	0 56·6	5·7	0·3	11·7	0·7	17·7	1·0
58	0 59·5	0 59·7	0 56·8	5·8	0·3	11·8	0·7	17·8	1·0
59	0 59·8	0 59·9	0 57·0	5·9	0·3	11·9	0·7	17·9	1·0
60	1 00·0	1 00·2	0 57·3	6·0	0·4	12·0	0·7	18·0	1·1

4m	SOL PLANETAS	ARIES	LUNA	v o d	Corrn	v o d	Corrn	v o d	Corrn
s	° ′	° ′	° ′	′	′	′	′	′	′
00	1 00·0	1 00·2	0 57·3	0·0	0·0	6·0	0·5	12·0	0·9
01	1 00·3	1 00·4	0 57·5	0·1	0·0	6·1	0·5	12·1	0·9
02	1 00·5	1 00·7	0 57·7	0·2	0·0	6·2	0·5	12·2	0·9
03	1 00·8	1 00·9	0 58·0	0·3	0·0	6·3	0·5	12·3	0·9
04	1 01·0	1 01·2	0 58·2	0·4	0·0	6·4	0·5	12·4	0·9
05	1 01·3	1 01·4	0 58·5	0·5	0·0	6·5	0·5	12·5	0·9
06	1 01·5	1 01·7	0 58·7	0·6	0·0	6·6	0·5	12·6	0·9
07	1 01·8	1 01·9	0 58·9	0·7	0·1	6·7	0·5	12·7	1·0
08	1 02·0	1 02·2	0 59·2	0·8	0·1	6·8	0·5	12·8	1·0
09	1 02·3	1 02·4	0 59·4	0·9	0·1	6·9	0·5	12·9	1·0
10	1 02·5	1 02·7	0 59·7	1·0	0·1	7·0	0·5	13·0	1·0
11	1 02·8	1 02·9	0 59·9	1·1	0·1	7·1	0·5	13·1	1·0
12	1 03·0	1 03·2	1 00·1	1·2	0·1	7·2	0·5	13·2	1·0
13	1 03·3	1 03·4	1 00·4	1·3	0·1	7·3	0·5	13·3	1·0
14	1 03·5	1 03·7	1 00·6	1·4	0·1	7·4	0·6	13·4	1·0
15	1 03·8	1 03·9	1 00·8	1·5	0·1	7·5	0·6	13·5	1·0
16	1 04·0	1 04·2	1 01·1	1·6	0·1	7·6	0·6	13·6	1·0
17	1 04·3	1 04·4	1 01·3	1·7	0·1	7·7	0·6	13·7	1·0
18	1 04·5	1 04·7	1 01·6	1·8	0·1	7·8	0·6	13·8	1·0
19	1 04·8	1 04·9	1 01·8	1·9	0·1	7·9	0·6	13·9	1·0
20	1 05·0	1 05·2	1 02·0	2·0	0·2	8·0	0·6	14·0	1·1
21	1 05·3	1 05·4	1 02·3	2·1	0·2	8·1	0·6	14·1	1·1
22	1 05·5	1 05·7	1 02·5	2·2	0·2	8·2	0·6	14·2	1·1
23	1 05·8	1 05·9	1 02·8	2·3	0·2	8·3	0·6	14·3	1·1
24	1 06·0	1 06·2	1 03·0	2·4	0·2	8·4	0·6	14·4	1·1
25	1 06·3	1 06·4	1 03·2	2·5	0·2	8·5	0·6	14·5	1·1
26	1 06·5	1 06·7	1 03·5	2·6	0·2	8·6	0·6	14·6	1·1
27	1 06·8	1 06·9	1 03·7	2·7	0·2	8·7	0·7	14·7	1·1
28	1 07·0	1 07·2	1 03·9	2·8	0·2	8·8	0·7	14·8	1·1
29	1 07·3	1 07·4	1 04·2	2·9	0·2	8·9	0·7	14·9	1·1
30	1 07·5	1 07·7	1 04·4	3·0	0·2	9·0	0·7	15·0	1·1
31	1 07·8	1 07·9	1 04·7	3·1	0·2	9·1	0·7	15·1	1·1
32	1 08·0	1 08·2	1 04·9	3·2	0·2	9·2	0·7	15·2	1·1
33	1 08·3	1 08·4	1 05·1	3·3	0·2	9·3	0·7	15·3	1·1
34	1 08·5	1 08·7	1 05·4	3·4	0·3	9·4	0·7	15·4	1·2
35	1 08·8	1 08·9	1 05·6	3·5	0·3	9·5	0·7	15·5	1·2
36	1 09·0	1 09·2	1 05·9	3·6	0·3	9·6	0·7	15·6	1·2
37	1 09·3	1 09·4	1 06·1	3·7	0·3	9·7	0·7	15·7	1·2
38	1 09·5	1 09·7	1 06·3	3·8	0·3	9·8	0·7	15·8	1·2
39	1 09·8	1 09·9	1 06·6	3·9	0·3	9·9	0·7	15·9	1·2
40	1 10·0	1 10·2	1 06·8	4·0	0·3	10·0	0·8	16·0	1·2
41	1 10·3	1 10·4	1 07·0	4·1	0·3	10·1	0·8	16·1	1·2
42	1 10·5	1 10·7	1 07·3	4·2	0·3	10·2	0·8	16·2	1·2
43	1 10·8	1 10·9	1 07·5	4·3	0·3	10·3	0·8	16·3	1·2
44	1 11·0	1 11·2	1 07·8	4·4	0·3	10·4	0·8	16·4	1·2
45	1 11·3	1 11·4	1 08·0	4·5	0·3	10·5	0·8	16·5	1·2
46	1 11·5	1 11·7	1 08·2	4·6	0·3	10·6	0·8	16·6	1·2
47	1 11·8	1 11·9	1 08·5	4·7	0·4	10·7	0·8	16·7	1·3
48	1 12·0	1 12·2	1 08·7	4·8	0·4	10·8	0·8	16·8	1·3
49	1 12·3	1 12·4	1 09·0	4·9	0·4	10·9	0·8	16·9	1·3
50	1 12·5	1 12·7	1 09·2	5·0	0·4	11·0	0·8	17·0	1·3
51	1 12·8	1 12·9	1 09·4	5·1	0·4	11·1	0·8	17·1	1·3
52	1 13·0	1 13·2	1 09·7	5·2	0·4	11·2	0·8	17·2	1·3
53	1 13·3	1 13·5	1 09·9	5·3	0·4	11·3	0·8	17·3	1·3
54	1 13·5	1 13·7	1 10·2	5·4	0·4	11·4	0·9	17·4	1·3
55	1 13·8	1 14·0	1 10·4	5·5	0·4	11·5	0·9	17·5	1·3
56	1 14·0	1 14·2	1 10·6	5·6	0·4	11·6	0·9	17·6	1·3
57	1 14·3	1 14·5	1 10·9	5·7	0·4	11·7	0·9	17·7	1·3
58	1 14·5	1 14·7	1 11·1	5·8	0·4	11·8	0·9	17·8	1·3
59	1 14·8	1 15·0	1 11·3	5·9	0·4	11·9	0·9	17·9	1·3
60	1 15·0	1 15·2	1 11·6	6·0	0·5	12·0	0·9	18·0	1·4

5m	SOL PLANETAS	ARIES	LUNA	v o d	Corrn	v o d	Corrn	v o d	Corrn
s	° ′	° ′	° ′	′	′	′	′	′	′
00	1 15·0	1 15·2	1 11·6	0·0	0·0	6·0	0·6	12·0	1·1
01	1 15·3	1 15·5	1 11·8	0·1	0·0	6·1	0·6	12·1	1·1
02	1 15·5	1 15·7	1 12·1	0·2	0·0	6·2	0·6	12·2	1·1
03	1 15·8	1 16·0	1 12·3	0·3	0·0	6·3	0·6	12·3	1·1
04	1 16·0	1 16·2	1 12·5	0·4	0·0	6·4	0·6	12·4	1·1
05	1 16·3	1 16·5	1 12·8	0·5	0·0	6·5	0·6	12·5	1·1
06	1 16·5	1 16·7	1 13·0	0·6	0·1	6·6	0·6	12·6	1·2
07	1 16·8	1 17·0	1 13·3	0·7	0·1	6·7	0·6	12·7	1·2
08	1 17·0	1 17·2	1 13·5	0·8	0·1	6·8	0·6	12·8	1·2
09	1 17·3	1 17·5	1 13·7	0·9	0·1	6·9	0·6	12·9	1·2
10	1 17·5	1 17·7	1 14·0	1·0	0·1	7·0	0·6	13·0	1·2
11	1 17·8	1 18·0	1 14·2	1·1	0·1	7·1	0·7	13·1	1·2
12	1 18·0	1 18·2	1 14·4	1·2	0·1	7·2	0·7	13·2	1·2
13	1 18·3	1 18·5	1 14·7	1·3	0·1	7·3	0·7	13·3	1·2
14	1 18·5	1 18·7	1 14·9	1·4	0·1	7·4	0·7	13·4	1·2
15	1 18·8	1 19·0	1 15·2	1·5	0·1	7·5	0·7	13·5	1·2
16	1 19·0	1 19·2	1 15·4	1·6	0·1	7·6	0·7	13·6	1·2
17	1 19·3	1 19·5	1 15·6	1·7	0·2	7·7	0·7	13·7	1·3
18	1 19·5	1 19·7	1 15·9	1·8	0·2	7·8	0·7	13·8	1·3
19	1 19·8	1 20·0	1 16·1	1·9	0·2	7·9	0·7	13·9	1·3
20	1 20·0	1 20·2	1 16·4	2·0	0·2	8·0	0·7	14·0	1·3
21	1 20·3	1 20·5	1 16·6	2·1	0·2	8·1	0·7	14·1	1·3
22	1 20·5	1 20·7	1 16·8	2·2	0·2	8·2	0·8	14·2	1·3
23	1 20·8	1 21·0	1 17·1	2·3	0·2	8·3	0·8	14·3	1·3
24	1 21·0	1 21·2	1 17·3	2·4	0·2	8·4	0·8	14·4	1·3
25	1 21·3	1 21·5	1 17·5	2·5	0·2	8·5	0·8	14·5	1·3
26	1 21·5	1 21·7	1 17·8	2·6	0·2	8·6	0·8	14·6	1·3
27	1 21·8	1 22·0	1 18·0	2·7	0·2	8·7	0·8	14·7	1·3
28	1 22·0	1 22·2	1 18·3	2·8	0·3	8·8	0·8	14·8	1·4
29	1 22·3	1 22·5	1 18·5	2·9	0·3	8·9	0·8	14·9	1·4
30	1 22·5	1 22·7	1 18·7	3·0	0·3	9·0	0·8	15·0	1·4
31	1 22·8	1 23·0	1 19·0	3·1	0·3	9·1	0·8	15·1	1·4
32	1 23·0	1 23·2	1 19·2	3·2	0·3	9·2	0·8	15·2	1·4
33	1 23·3	1 23·5	1 19·5	3·3	0·3	9·3	0·9	15·3	1·4
34	1 23·5	1 23·7	1 19·7	3·4	0·3	9·4	0·9	15·4	1·4
35	1 23·8	1 24·0	1 19·9	3·5	0·3	9·5	0·9	15·5	1·4
36	1 24·0	1 24·2	1 20·2	3·6	0·3	9·6	0·9	15·6	1·4
37	1 24·3	1 24·5	1 20·4	3·7	0·3	9·7	0·9	15·7	1·4
38	1 24·5	1 24·7	1 20·7	3·8	0·3	9·8	0·9	15·8	1·4
39	1 24·8	1 25·0	1 20·9	3·9	0·4	9·9	0·9	15·9	1·5
40	1 25·0	1 25·2	1 21·1	4·0	0·4	10·0	0·9	16·0	1·5
41	1 25·3	1 25·5	1 21·4	4·1	0·4	10·1	0·9	16·1	1·5
42	1 25·5	1 25·7	1 21·6	4·2	0·4	10·2	0·9	16·2	1·5
43	1 25·8	1 26·0	1 21·8	4·3	0·4	10·3	0·9	16·3	1·5
44	1 26·0	1 26·2	1 22·1	4·4	0·4	10·4	1·0	16·4	1·5
45	1 26·3	1 26·5	1 22·3	4·5	0·4	10·5	1·0	16·5	1·5
46	1 26·5	1 26·7	1 22·6	4·6	0·4	10·6	1·0	16·6	1·5
47	1 26·8	1 27·0	1 22·8	4·7	0·4	10·7	1·0	16·7	1·5
48	1 27·0	1 27·2	1 23·0	4·8	0·4	10·8	1·0	16·8	1·5
49	1 27·3	1 27·5	1 23·3	4·9	0·4	10·9	1·0	16·9	1·5
50	1 27·5	1 27·7	1 23·5	5·0	0·5	11·0	1·0	17·0	1·6
51	1 27·8	1 28·0	1 23·8	5·1	0·5	11·1	1·0	17·1	1·6
52	1 28·0	1 28·2	1 24·0	5·2	0·5	11·2	1·0	17·2	1·6
53	1 28·3	1 28·5	1 24·2	5·3	0·5	11·3	1·0	17·3	1·6
54	1 28·5	1 28·7	1 24·5	5·4	0·5	11·4	1·0	17·4	1·6
55	1 28·8	1 29·0	1 24·7	5·5	0·5	11·5	1·1	17·5	1·6
56	1 29·0	1 29·2	1 24·9	5·6	0·5	11·6	1·1	17·6	1·6
57	1 29·3	1 29·5	1 25·2	5·7	0·5	11·7	1·1	17·7	1·6
58	1 29·5	1 29·7	1 25·4	5·8	0·5	11·8	1·1	17·8	1·6
59	1 29·8	1 30·0	1 25·7	5·9	0·5	11·9	1·1	17·9	1·6
60	1 30·0	1 30·2	1 25·9	6·0	0·6	12·0	1·1	18·0	1·7

6m	SOL PLANETAS	ARIES	LUNA	v o d	Corrn	v o d	Corrn	v o d	Corrn
s	° ′	° ′	° ′	′	′	′	′	′	′
00	1 30·0	1 30·2	1 25·9	0·0	0·0	6·0	0·7	12·0	1·3
01	1 30·3	1 30·5	1 26·1	0·1	0·0	6·1	0·7	12·1	1·3
02	1 30·5	1 30·7	1 26·4	0·2	0·0	6·2	0·7	12·2	1·3
03	1 30·8	1 31·0	1 26·6	0·3	0·0	6·3	0·7	12·3	1·3
04	1 31·0	1 31·2	1 26·9	0·4	0·0	6·4	0·7	12·4	1·3
05	1 31·3	1 31·5	1 27·1	0·5	0·1	6·5	0·7	12·5	1·4
06	1 31·5	1 31·8	1 27·3	0·6	0·1	6·6	0·7	12·6	1·4
07	1 31·8	1 32·0	1 27·6	0·7	0·1	6·7	0·7	12·7	1·4
08	1 32·0	1 32·3	1 27·8	0·8	0·1	6·8	0·7	12·8	1·4
09	1 32·3	1 32·5	1 28·0	0·9	0·1	6·9	0·7	12·9	1·4
10	1 32·5	1 32·8	1 28·3	1·0	0·1	7·0	0·8	13·0	1·4
11	1 32·8	1 33·0	1 28·5	1·1	0·1	7·1	0·8	13·1	1·4
12	1 33·0	1 33·3	1 28·8	1·2	0·1	7·2	0·8	13·2	1·4
13	1 33·3	1 33·5	1 29·0	1·3	0·1	7·3	0·8	13·3	1·4
14	1 33·5	1 33·8	1 29·2	1·4	0·2	7·4	0·8	13·4	1·5
15	1 33·8	1 34·0	1 29·5	1·5	0·2	7·5	0·8	13·5	1·5
16	1 34·0	1 34·3	1 29·7	1·6	0·2	7·6	0·8	13·6	1·5
17	1 34·3	1 34·5	1 30·0	1·7	0·2	7·7	0·8	13·7	1·5
18	1 34·5	1 34·8	1 30·2	1·8	0·2	7·8	0·8	13·8	1·5
19	1 34·8	1 35·0	1 30·4	1·9	0·2	7·9	0·9	13·9	1·5
20	1 35·0	1 35·3	1 30·7	2·0	0·2	8·0	0·9	14·0	1·5
21	1 35·3	1 35·5	1 30·9	2·1	0·2	8·1	0·9	14·1	1·5
22	1 35·5	1 35·8	1 31·1	2·2	0·2	8·2	0·9	14·2	1·5
23	1 35·8	1 36·0	1 31·4	2·3	0·2	8·3	0·9	14·3	1·5
24	1 36·0	1 36·3	1 31·6	2·4	0·3	8·4	0·9	14·4	1·6
25	1 36·3	1 36·5	1 31·9	2·5	0·3	8·5	0·9	14·5	1·6
26	1 36·5	1 36·8	1 32·1	2·6	0·3	8·6	0·9	14·6	1·6
27	1 36·8	1 37·0	1 32·3	2·7	0·3	8·7	0·9	14·7	1·6
28	1 37·0	1 37·3	1 32·6	2·8	0·3	8·8	1·0	14·8	1·6
29	1 37·3	1 37·5	1 32·8	2·9	0·3	8·9	1·0	14·9	1·6
30	1 37·5	1 37·8	1 33·1	3·0	0·3	9·0	1·0	15·0	1·6
31	1 37·8	1 38·0	1 33·3	3·1	0·3	9·1	1·0	15·1	1·6
32	1 38·0	1 38·3	1 33·5	3·2	0·3	9·2	1·0	15·2	1·6
33	1 38·3	1 38·5	1 33·8	3·3	0·4	9·3	1·0	15·3	1·7
34	1 38·5	1 38·8	1 34·0	3·4	0·4	9·4	1·0	15·4	1·7
35	1 38·8	1 39·0	1 34·3	3·5	0·4	9·5	1·0	15·5	1·7
36	1 39·0	1 39·3	1 34·5	3·6	0·4	9·6	1·0	15·6	1·7
37	1 39·3	1 39·5	1 34·7	3·7	0·4	9·7	1·1	15·7	1·7
38	1 39·5	1 39·8	1 35·0	3·8	0·4	9·8	1·1	15·8	1·7
39	1 39·8	1 40·0	1 35·2	3·9	0·4	9·9	1·1	15·9	1·7
40	1 40·0	1 40·3	1 35·4	4·0	0·4	10·0	1·1	16·0	1·7
41	1 40·3	1 40·5	1 35·7	4·1	0·4	10·1	1·1	16·1	1·7
42	1 40·5	1 40·8	1 35·9	4·2	0·5	10·2	1·1	16·2	1·8
43	1 40·8	1 41·0	1 36·2	4·3	0·5	10·3	1·1	16·3	1·8
44	1 41·0	1 41·3	1 36·4	4·4	0·5	10·4	1·1	16·4	1·8
45	1 41·3	1 41·5	1 36·6	4·5	0·5	10·5	1·1	16·5	1·8
46	1 41·5	1 41·8	1 36·9	4·6	0·5	10·6	1·1	16·6	1·8
47	1 41·8	1 42·0	1 37·1	4·7	0·5	10·7	1·2	16·7	1·8
48	1 42·0	1 42·3	1 37·4	4·8	0·5	10·8	1·2	16·8	1·8
49	1 42·3	1 42·5	1 37·6	4·9	0·5	10·9	1·2	16·9	1·8
50	1 42·5	1 42·8	1 37·8	5·0	0·5	11·0	1·2	17·0	1·8
51	1 42·8	1 43·0	1 38·1	5·1	0·6	11·1	1·2	17·1	1·9
52	1 43·0	1 43·3	1 38·3	5·2	0·6	11·2	1·2	17·2	1·9
53	1 43·3	1 43·5	1 38·5	5·3	0·6	11·3	1·2	17·3	1·9
54	1 43·5	1 43·8	1 38·8	5·4	0·6	11·4	1·2	17·4	1·9
55	1 43·8	1 44·0	1 39·0	5·5	0·6	11·5	1·2	17·5	1·9
56	1 44·0	1 44·3	1 39·3	5·6	0·6	11·6	1·3	17·6	1·9
57	1 44·3	1 44·5	1 39·5	5·7	0·6	11·7	1·3	17·7	1·9
58	1 44·5	1 44·8	1 39·7	5·8	0·6	11·8	1·3	17·8	1·9
59	1 44·8	1 45·0	1 40·0	5·9	0·6	11·9	1·3	17·9	1·9
60	1 45·0	1 45·3	1 40·2	6·0	0·7	12·0	1·3	18·0	2·0

7m	SOL PLANETAS	ARIES	LUNA	v o d	Corrn	v o d	Corrn	v o d	Corrn
s	° ′	° ′	° ′	′	′	′	′	′	′
00	1 45·0	1 45·3	1 40·2	0·0	0·0	6·0	0·8	12·0	1·5
01	1 45·3	1 45·5	1 40·5	0·1	0·0	6·1	0·8	12·1	1·5
02	1 45·5	1 45·8	1 40·7	0·2	0·0	6·2	0·8	12·2	1·5
03	1 45·8	1 46·0	1 40·9	0·3	0·0	6·3	0·8	12·3	1·5
04	1 46·0	1 46·3	1 41·2	0·4	0·1	6·4	0·8	12·4	1·6
05	1 46·3	1 46·5	1 41·4	0·5	0·1	6·5	0·8	12·5	1·6
06	1 46·5	1 46·8	1 41·6	0·6	0·1	6·6	0·8	12·6	1·6
07	1 46·8	1 47·0	1 41·9	0·7	0·1	6·7	0·8	12·7	1·6
08	1 47·0	1 47·3	1 42·1	0·8	0·1	6·8	0·9	12·8	1·6
09	1 47·3	1 47·5	1 42·4	0·9	0·1	6·9	0·9	12·9	1·6
10	1 47·5	1 47·8	1 42·6	1·0	0·1	7·0	0·9	13·0	1·6
11	1 47·8	1 48·0	1 42·8	1·1	0·1	7·1	0·9	13·1	1·6
12	1 48·0	1 48·3	1 43·1	1·2	0·2	7·2	0·9	13·2	1·7
13	1 48·3	1 48·5	1 43·3	1·3	0·2	7·3	0·9	13·3	1·7
14	1 48·5	1 48·8	1 43·6	1·4	0·2	7·4	0·9	13·4	1·7
15	1 48·8	1 49·0	1 43·8	1·5	0·2	7·5	0·9	13·5	1·7
16	1 49·0	1 49·3	1 44·0	1·6	0·2	7·6	1·0	13·6	1·7
17	1 49·3	1 49·5	1 44·3	1·7	0·2	7·7	1·0	13·7	1·7
18	1 49·5	1 49·8	1 44·5	1·8	0·2	7·8	1·0	13·8	1·7
19	1 49·8	1 50·1	1 44·8	1·9	0·2	7·9	1·0	13·9	1·7
20	1 50·0	1 50·3	1 45·0	2·0	0·3	8·0	1·0	14·0	1·8
21	1 50·3	1 50·6	1 45·2	2·1	0·3	8·1	1·0	14·1	1·8
22	1 50·5	1 50·8	1 45·5	2·2	0·3	8·2	1·0	14·2	1·8
23	1 50·8	1 51·1	1 45·7	2·3	0·3	8·3	1·0	14·3	1·8
24	1 51·0	1 51·3	1 45·9	2·4	0·3	8·4	1·1	14·4	1·8
25	1 51·3	1 51·6	1 46·2	2·5	0·3	8·5	1·1	14·5	1·8
26	1 51·5	1 51·8	1 46·4	2·6	0·3	8·6	1·1	14·6	1·8
27	1 51·8	1 52·1	1 46·7	2·7	0·3	8·7	1·1	14·7	1·8
28	1 52·0	1 52·3	1 46·9	2·8	0·4	8·8	1·1	14·8	1·9
29	1 52·3	1 52·6	1 47·1	2·9	0·4	8·9	1·1	14·9	1·9
30	1 52·5	1 52·8	1 47·4	3·0	0·4	9·0	1·1	15·0	1·9
31	1 52·8	1 53·1	1 47·6	3·1	0·4	9·1	1·1	15·1	1·9
32	1 53·0	1 53·3	1 47·9	3·2	0·4	9·2	1·2	15·2	1·9
33	1 53·3	1 53·6	1 48·1	3·3	0·4	9·3	1·2	15·3	1·9
34	1 53·5	1 53·8	1 48·3	3·4	0·4	9·4	1·2	15·4	1·9
35	1 53·8	1 54·1	1 48·6	3·5	0·4	9·5	1·2	15·5	1·9
36	1 54·0	1 54·3	1 48·8	3·6	0·5	9·6	1·2	15·6	2·0
37	1 54·3	1 54·6	1 49·0	3·7	0·5	9·7	1·2	15·7	2·0
38	1 54·5	1 54·8	1 49·3	3·8	0·5	9·8	1·2	15·8	2·0
39	1 54·8	1 55·1	1 49·5	3·9	0·5	9·9	1·2	15·9	2·0
40	1 55·0	1 55·3	1 49·8	4·0	0·5	10·0	1·3	16·0	2·0
41	1 55·3	1 55·6	1 50·0	4·1	0·5	10·1	1·3	16·1	2·0
42	1 55·5	1 55·8	1 50·2	4·2	0·5	10·2	1·3	16·2	2·0
43	1 55·8	1 56·1	1 50·5	4·3	0·5	10·3	1·3	16·3	2·0
44	1 56·0	1 56·3	1 50·7	4·4	0·6	10·4	1·3	16·4	2·1
45	1 56·3	1 56·6	1 51·0	4·5	0·6	10·5	1·3	16·5	2·1
46	1 56·5	1 56·8	1 51·2	4·6	0·6	10·6	1·3	16·6	2·1
47	1 56·8	1 57·1	1 51·4	4·7	0·6	10·7	1·3	16·7	2·1
48	1 57·0	1 57·3	1 51·7	4·8	0·6	10·8	1·4	16·8	2·1
49	1 57·3	1 57·6	1 51·9	4·9	0·6	10·9	1·4	16·9	2·1
50	1 57·5	1 57·8	1 52·1	5·0	0·6	11·0	1·4	17·0	2·1
51	1 57·8	1 58·1	1 52·4	5·1	0·6	11·1	1·4	17·1	2·1
52	1 58·0	1 58·3	1 52·6	5·2	0·7	11·2	1·4	17·2	2·2
53	1 58·3	1 58·6	1 52·9	5·3	0·7	11·3	1·4	17·3	2·2
54	1 58·5	1 58·8	1 53·1	5·4	0·7	11·4	1·4	17·4	2·2
55	1 58·8	1 59·1	1 53·3	5·5	0·7	11·5	1·4	17·5	2·2
56	1 59·0	1 59·3	1 53·6	5·6	0·7	11·6	1·5	17·6	2·2
57	1 59·3	1 59·6	1 53·8	5·7	0·7	11·7	1·5	17·7	2·2
58	1 59·5	1 59·8	1 54·1	5·8	0·7	11·8	1·5	17·8	2·2
59	1 59·8	2 00·1	1 54·3	5·9	0·7	11·9	1·5	17·9	2·2
60	2 00·0	2 00·3	1 54·5	6·0	0·8	12·0	1·5	18·0	2·3

m 8	SOL PLANETAS	ARIES	LUNA	v o d Corrn		v o d Corrn		v o d Corrn	
s	° ′	° ′	° ′	′	′	′	′	′	′
00	2 00·0	2 00·3	1 54·5	0·0	0·0	6·0	0·9	12·0	1·7
01	2 00·3	2 00·6	1 54·8	0·1	0·0	6·1	0·9	12·1	1·7
02	2 00·5	2 00·8	1 55·0	0·2	0·0	6·2	0·9	12·2	1·7
03	2 00·8	2 01·1	1 55·2	0·3	0·0	6·3	0·9	12·3	1·7
04	2 01·0	2 01·3	1 55·5	0·4	0·1	6·4	0·9	12·4	1·8
05	2 01·3	2 01·6	1 55·7	0·5	0·1	6·5	0·9	12·5	1·8
06	2 01·5	2 01·8	1 56·0	0·6	0·1	6·6	0·9	12·6	1·8
07	2 01·8	2 02·1	1 56·2	0·7	0·1	6·7	0·9	12·7	1·8
08	2 02·0	2 02·3	1 56·4	0·8	0·1	6·8	1·0	12·8	1·8
09	2 02·3	2 02·6	1 56·7	0·9	0·1	6·9	1·0	12·9	1·8
10	2 02·5	2 02·8	1 56·9	1·0	0·1	7·0	1·0	13·0	1·8
11	2 02·8	2 03·1	1 57·2	1·1	0·2	7·1	1·0	13·1	1·9
12	2 03·0	2 03·3	1 57·4	1·2	0·2	7·2	1·0	13·2	1·9
13	2 03·3	2 03·6	1 57·6	1·3	0·2	7·3	1·0	13·3	1·9
14	2 03·5	2 03·8	1 57·9	1·4	0·2	7·4	1·0	13·4	1·9
15	2 03·8	2 04·1	1 58·1	1·5	0·2	7·5	1·1	13·5	1·9
16	2 04·0	2 04·3	1 58·4	1·6	0·2	7·6	1·1	13·6	1·9
17	2 04·3	2 04·6	1 58·6	1·7	0·2	7·7	1·1	13·7	1·9
18	2 04·5	2 04·8	1 58·8	1·8	0·3	7·8	1·1	13·8	2·0
19	2 04·8	2 05·1	1 59·1	1·9	0·3	7·9	1·1	13·9	2·0
20	2 05·0	2 05·3	1 59·3	2·0	0·3	8·0	1·1	14·0	2·0
21	2 05·3	2 05·6	1 59·5	2·1	0·3	8·1	1·1	14·1	2·0
22	2 05·5	2 05·8	1 59·8	2·2	0·3	8·2	1·2	14·2	2·0
23	2 05·8	2 06·1	2 00·0	2·3	0·3	8·3	1·2	14·3	2·0
24	2 06·0	2 06·3	2 00·3	2·4	0·3	8·4	1·2	14·4	2·0
25	2 06·3	2 06·6	2 00·5	2·5	0·4	8·5	1·2	14·5	2·1
26	2 06·5	2 06·8	2 00·7	2·6	0·4	8·6	1·2	14·6	2·1
27	2 06·8	2 07·1	2 01·0	2·7	0·4	8·7	1·2	14·7	2·1
28	2 07·0	2 07·3	2 01·2	2·8	0·4	8·8	1·2	14·8	2·1
29	2 07·3	2 07·6	2 01·5	2·9	0·4	8·9	1·3	14·9	2·1
30	2 07·5	2 07·8	2 01·7	3·0	0·4	9·0	1·3	15·0	2·1
31	2 07·8	2 08·1	2 01·9	3·1	0·4	9·1	1·3	15·1	2·1
32	2 08·0	2 08·4	2 02·2	3·2	0·5	9·2	1·3	15·2	2·2
33	2 08·3	2 08·6	2 02·4	3·3	0·5	9·3	1·3	15·3	2·2
34	2 08·5	2 08·9	2 02·6	3·4	0·5	9·4	1·3	15·4	2·2
35	2 08·8	2 09·1	2 02·9	3·5	0·5	9·5	1·3	15·5	2·2
36	2 09·0	2 09·4	2 03·1	3·6	0·5	9·6	1·4	15·6	2·2
37	2 09·3	2 09·6	2 03·4	3·7	0·5	9·7	1·4	15·7	2·2
38	2 09·5	2 09·9	2 03·6	3·8	0·5	9·8	1·4	15·8	2·2
39	2 09·8	2 10·1	2 03·8	3·9	0·6	9·9	1·4	15·9	2·3
40	2 10·0	2 10·4	2 04·1	4·0	0·6	10·0	1·4	16·0	2·3
41	2 10·3	2 10·6	2 04·3	4·1	0·6	10·1	1·4	16·1	2·3
42	2 10·5	2 10·9	2 04·6	4·2	0·6	10·2	1·4	16·2	2·3
43	2 10·8	2 11·1	2 04·8	4·3	0·6	10·3	1·5	16·3	2·3
44	2 11·0	2 11·4	2 05·0	4·4	0·6	10·4	1·5	16·4	2·3
45	2 11·3	2 11·6	2 05·3	4·5	0·6	10·5	1·5	16·5	2·3
46	2 11·5	2 11·9	2 05·5	4·6	0·7	10·6	1·5	16·6	2·4
47	2 11·8	2 12·1	2 05·7	4·7	0·7	10·7	1·5	16·7	2·4
48	2 12·0	2 12·4	2 06·0	4·8	0·7	10·8	1·5	16·8	2·4
49	2 12·3	2 12·6	2 06·2	4·9	0·7	10·9	1·5	16·9	2·4
50	2 12·5	2 12·9	2 06·5	5·0	0·7	11·0	1·6	17·0	2·4
51	2 12·8	2 13·1	2 06·7	5·1	0·7	11·1	1·6	17·1	2·4
52	2 13·0	2 13·4	2 06·9	5·2	0·7	11·2	1·6	17·2	2·4
53	2 13·3	2 13·6	2 07·2	5·3	0·8	11·3	1·6	17·3	2·5
54	2 13·5	2 13·9	2 07·4	5·4	0·8	11·4	1·6	17·4	2·5
55	2 13·8	2 14·1	2 07·7	5·5	0·8	11·5	1·6	17·5	2·5
56	2 14·0	2 14·4	2 07·9	5·6	0·8	11·6	1·6	17·6	2·5
57	2 14·3	2 14·6	2 08·1	5·7	0·8	11·7	1·7	17·7	2·5
58	2 14·5	2 14·9	2 08·4	5·8	0·8	11·8	1·7	17·8	2·5
59	2 14·8	2 15·1	2 08·6	5·9	0·8	11·9	1·7	17·9	2·5
60	2 15·0	2 15·4	2 08·9	6·0	0·9	12·0	1·7	18·0	2·6

m 9	SOL PLANETAS	ARIES	LUNA	v o d Corrn		v o d Corrn		v o d Corrn	
s	° ′	° ′	° ′	′	′	′	′	′	′
00	2 15·0	2 15·4	2 08·9	0·0	0·0	6·0	1·0	12·0	1·9
01	2 15·3	2 15·6	2 09·1	0·1	0·0	6·1	1·0	12·1	1·9
02	2 15·5	2 15·9	2 09·3	0·2	0·0	6·2	1·0	12·2	1·9
03	2 15·8	2 16·1	2 09·6	0·3	0·0	6·3	1·0	12·3	1·9
04	2 16·0	2 16·4	2 09·8	0·4	0·1	6·4	1·0	12·4	2·0
05	2 16·3	2 16·6	2 10·0	0·5	0·1	6·5	1·0	12·5	2·0
06	2 16·5	2 16·9	2 10·3	0·6	0·1	6·6	1·0	12·6	2·0
07	2 16·8	2 17·1	2 10·5	0·7	0·1	6·7	1·1	12·7	2·0
08	2 17·0	2 17·4	2 10·8	0·8	0·1	6·8	1·1	12·8	2·0
09	2 17·3	2 17·6	2 11·0	0·9	0·1	6·9	1·1	12·9	2·0
10	2 17·5	2 17·9	2 11·2	1·0	0·2	7·0	1·1	13·0	2·1
11	2 17·8	2 18·1	2 11·5	1·1	0·2	7·1	1·1	13·1	2·1
12	2 18·0	2 18·4	2 11·7	1·2	0·2	7·2	1·1	13·2	2·1
13	2 18·3	2 18·6	2 12·0	1·3	0·2	7·3	1·2	13·3	2·1
14	2 18·5	2 18·9	2 12·2	1·4	0·2	7·4	1·2	13·4	2·1
15	2 18·8	2 19·1	2 12·4	1·5	0·2	7·5	1·2	13·5	2·1
16	2 19·0	2 19·4	2 12·7	1·6	0·3	7·6	1·2	13·6	2·2
17	2 19·3	2 19·6	2 12·9	1·7	0·3	7·7	1·2	13·7	2·2
18	2 19·5	2 19·9	2 13·1	1·8	0·3	7·8	1·2	13·8	2·2
19	2 19·8	2 20·1	2 13·4	1·9	0·3	7·9	1·3	13·9	2·2
20	2 20·0	2 20·4	2 13·6	2·0	0·3	8·0	1·3	14·0	2·2
21	2 20·3	2 20·6	2 13·9	2·1	0·3	8·1	1·3	14·1	2·2
22	2 20·5	2 20·9	2 14·1	2·2	0·3	8·2	1·3	14·2	2·2
23	2 20·8	2 21·1	2 14·3	2·3	0·4	8·3	1·3	14·3	2·3
24	2 21·0	2 21·4	2 14·6	2·4	0·4	8·4	1·3	14·4	2·3
25	2 21·3	2 21·6	2 14·8	2·5	0·4	8·5	1·3	14·5	2·3
26	2 21·5	2 21·9	2 15·1	2·6	0·4	8·6	1·4	14·6	2·3
27	2 21·8	2 22·1	2 15·3	2·7	0·4	8·7	1·4	14·7	2·3
28	2 22·0	2 22·4	2 15·5	2·8	0·4	8·8	1·4	14·8	2·3
29	2 22·3	2 22·6	2 15·8	2·9	0·5	8·9	1·4	14·9	2·4
30	2 22·5	2 22·9	2 16·0	3·0	0·5	9·0	1·4	15·0	2·4
31	2 22·8	2 23·1	2 16·2	3·1	0·5	9·1	1·4	15·1	2·4
32	2 23·0	2 23·4	2 16·5	3·2	0·5	9·2	1·5	15·2	2·4
33	2 23·3	2 23·6	2 16·7	3·3	0·5	9·3	1·5	15·3	2·4
34	2 23·5	2 23·9	2 17·0	3·4	0·5	9·4	1·5	15·4	2·4
35	2 23·8	2 24·1	2 17·2	3·5	0·6	9·5	1·5	15·5	2·5
36	2 24·0	2 24·4	2 17·4	3·6	0·6	9·6	1·5	15·6	2·5
37	2 24·3	2 24·6	2 17·7	3·7	0·6	9·7	1·5	15·7	2·5
38	2 24·5	2 24·9	2 17·9	3·8	0·6	9·8	1·6	15·8	2·5
39	2 24·8	2 25·1	2 18·2	3·9	0·6	9·9	1·6	15·9	2·5
40	2 25·0	2 25·4	2 18·4	4·0	0·6	10·0	1·6	16·0	2·5
41	2 25·3	2 25·6	2 18·6	4·1	0·6	10·1	1·6	16·1	2·5
42	2 25·5	2 25·9	2 18·9	4·2	0·7	10·2	1·6	16·2	2·6
43	2 25·8	2 26·1	2 19·1	4·3	0·7	10·3	1·6	16·3	2·6
44	2 26·0	2 26·4	2 19·3	4·4	0·7	10·4	1·6	16·4	2·6
45	2 26·3	2 26·7	2 19·6	4·5	0·7	10·5	1·7	16·5	2·6
46	2 26·5	2 26·9	2 19·8	4·6	0·7	10·6	1·7	16·6	2·6
47	2 26·8	2 27·2	2 20·1	4·7	0·7	10·7	1·7	16·7	2·6
48	2 27·0	2 27·4	2 20·3	4·8	0·8	10·8	1·7	16·8	2·7
49	2 27·3	2 27·7	2 20·5	4·9	0·8	10·9	1·7	16·9	2·7
50	2 27·5	2 27·9	2 20·8	5·0	0·8	11·0	1·7	17·0	2·7
51	2 27·8	2 28·2	2 21·0	5·1	0·8	11·1	1·8	17·1	2·7
52	2 28·0	2 28·4	2 21·3	5·2	0·8	11·2	1·8	17·2	2·7
53	2 28·3	2 28·7	2 21·5	5·3	0·8	11·3	1·8	17·3	2·7
54	2 28·5	2 28·9	2 21·7	5·4	0·9	11·4	1·8	17·4	2·8
55	2 28·8	2 29·2	2 22·0	5·5	0·9	11·5	1·8	17·5	2·8
56	2 29·0	2 29·4	2 22·2	5·6	0·9	11·6	1·8	17·6	2·8
57	2 29·3	2 29·7	2 22·5	5·7	0·9	11·7	1·9	17·7	2·8
58	2 29·5	2 29·9	2 22·7	5·8	0·9	11·8	1·9	17·8	2·8
59	2 29·8	2 30·2	2 22·9	5·9	0·9	11·9	1·9	17·9	2·8
60	2 30·0	2 30·4	2 23·2	6·0	1·0	12·0	1·9	18·0	2·9

10m	SOL PLANETAS	ARIES	LUNA	v or d	Corrn	v or d	Corrn	v or d	Corrn
s	° ′	° ′	° ′	′	′	′	′	′	′
00	2 30·0	2 30·4	2 23·2	0·0	0·0	6·0	1·1	12·0	2·1
01	2 30·3	2 30·7	2 23·4	0·1	0·0	6·1	1·1	12·1	2·1
02	2 30·5	2 30·9	2 23·6	0·2	0·0	6·2	1·1	12·2	2·1
03	2 30·8	2 31·2	2 23·9	0·3	0·1	6·3	1·1	12·3	2·2
04	2 31·0	2 31·4	2 24·1	0·4	0·1	6·4	1·1	12·4	2·2
05	2 31·3	2 31·7	2 24·4	0·5	0·1	6·5	1·1	12·5	2·2
06	2 31·5	2 31·9	2 24·6	0·6	0·1	6·6	1·2	12·6	2·2
07	2 31·8	2 32·2	2 24·8	0·7	0·1	6·7	1·2	12·7	2·2
08	2 32·0	2 32·4	2 25·1	0·8	0·1	6·8	1·2	12·8	2·2
09	2 32·3	2 32·7	2 25·3	0·9	0·2	6·9	1·2	12·9	2·3
10	2 32·5	2 32·9	2 25·6	1·0	0·2	7·0	1·2	13·0	2·3
11	2 32·8	2 33·2	2 25·8	1·1	0·2	7·1	1·2	13·1	2·3
12	2 33·0	2 33·4	2 26·0	1·2	0·2	7·2	1·3	13·2	2·3
13	2 33·3	2 33·7	2 26·3	1·3	0·2	7·3	1·3	13·3	2·3
14	2 33·5	2 33·9	2 26·5	1·4	0·2	7·4	1·3	13·4	2·3
15	2 33·8	2 34·2	2 26·7	1·5	0·3	7·5	1·3	13·5	2·4
16	2 34·0	2 34·4	2 27·0	1·6	0·3	7·6	1·3	13·6	2·4
17	2 34·3	2 34·7	2 27·2	1·7	0·3	7·7	1·3	13·7	2·4
18	2 34·5	2 34·9	2 27·5	1·8	0·3	7·8	1·4	13·8	2·4
19	2 34·8	2 35·2	2 27·7	1·9	0·3	7·9	1·4	13·9	2·4
20	2 35·0	2 35·4	2 27·9	2·0	0·4	8·0	1·4	14·0	2·5
21	2 35·3	2 35·7	2 28·2	2·1	0·4	8·1	1·4	14·1	2·5
22	2 35·5	2 35·9	2 28·4	2·2	0·4	8·2	1·4	14·2	2·5
23	2 35·8	2 36·2	2 28·7	2·3	0·4	8·3	1·5	14·3	2·5
24	2 36·0	2 36·4	2 28·9	2·4	0·4	8·4	1·5	14·4	2·5
25	2 36·3	2 36·7	2 29·1	2·5	0·4	8·5	1·5	14·5	2·5
26	2 36·5	2 36·9	2 29·4	2·6	0·5	8·6	1·5	14·6	2·6
27	2 36·8	2 37·2	2 29·6	2·7	0·5	8·7	1·5	14·7	2·6
28	2 37·0	2 37·4	2 29·8	2·8	0·5	8·8	1·5	14·8	2·6
29	2 37·3	2 37·7	2 30·1	2·9	0·5	8·9	1·6	14·9	2·6
30	2 37·5	2 37·9	2 30·3	3·0	0·5	9·0	1·6	15·0	2·6
31	2 37·8	2 38·2	2 30·6	3·1	0·5	9·1	1·6	15·1	2·6
32	2 38·0	2 38·4	2 30·8	3·2	0·6	9·2	1·6	15·2	2·7
33	2 38·3	2 38·7	2 31·0	3·3	0·6	9·3	1·6	15·3	2·7
34	2 38·5	2 38·9	2 31·3	3·4	0·6	9·4	1·6	15·4	2·7
35	2 38·8	2 39·2	2 31·5	3·5	0·6	9·5	1·7	15·5	2·7
36	2 39·0	2 39·4	2 31·8	3·6	0·6	9·6	1·7	15·6	2·7
37	2 39·3	2 39·7	2 32·0	3·7	0·6	9·7	1·7	15·7	2·7
38	2 39·5	2 39·9	2 32·2	3·8	0·7	9·8	1·7	15·8	2·8
39	2 39·8	2 40·2	2 32·5	3·9	0·7	9·9	1·7	15·9	2·8
40	2 40·0	2 40·4	2 32·7	4·0	0·7	10·0	1·8	16·0	2·8
41	2 40·3	2 40·7	2 32·9	4·1	0·7	10·1	1·8	16·1	2·8
42	2 40·5	2 40·9	2 33·2	4·2	0·7	10·2	1·8	16·2	2·8
43	2 40·8	2 41·2	2 33·4	4·3	0·8	10·3	1·8	16·3	2·9
44	2 41·0	2 41·4	2 33·7	4·4	0·8	10·4	1·8	16·4	2·9
45	2 41·3	2 41·7	2 33·9	4·5	0·8	10·5	1·8	16·5	2·9
46	2 41·5	2 41·9	2 34·1	4·6	0·8	10·6	1·9	16·6	2·9
47	2 41·8	2 42·2	2 34·4	4·7	0·8	10·7	1·9	16·7	2·9
48	2 42·0	2 42·4	2 34·6	4·8	0·8	10·8	1·9	16·8	2·9
49	2 42·3	2 42·7	2 34·9	4·9	0·9	10·9	1·9	16·9	3·0
50	2 42·5	2 42·9	2 35·1	5·0	0·9	11·0	1·9	17·0	3·0
51	2 42·8	2 43·2	2 35·3	5·1	0·9	11·1	1·9	17·1	3·0
52	2 43·0	2 43·4	2 35·6	5·2	0·9	11·2	2·0	17·2	3·0
53	2 43·3	2 43·7	2 35·8	5·3	0·9	11·3	2·0	17·3	3·0
54	2 43·5	2 43·9	2 36·1	5·4	0·9	11·4	2·0	17·4	3·0
55	2 43·8	2 44·2	2 36·3	5·5	1·0	11·5	2·0	17·5	3·1
56	2 44·0	2 44·4	2 36·5	5·6	1·0	11·6	2·0	17·6	3·1
57	2 44·3	2 44·7	2 36·8	5·7	1·0	11·7	2·0	17·7	3·1
58	2 44·5	2 45·0	2 37·0	5·8	1·0	11·8	2·1	17·8	3·1
59	2 44·8	2 45·2	2 37·2	5·9	1·0	11·9	2·1	17·9	3·1
60	2 45·0	2 45·5	2 37·5	6·0	1·1	12·0	2·1	18·0	3·2

11m	SOL PLANETAS	ARIES	LUNA	v or d	Corrn	v or d	Corrn	v or d	Corrn
s	° ′	° ′	° ′	′	′	′	′	′	′
00	2 45·0	2 45·5	2 37·5	0·0	0·0	6·0	1·2	12·0	2·3
01	2 45·3	2 45·7	2 37·7	0·1	0·0	6·1	1·2	12·1	2·3
02	2 45·5	2 46·0	2 38·0	0·2	0·0	6·2	1·2	12·2	2·3
03	2 45·8	2 46·2	2 38·2	0·3	0·1	6·3	1·2	12·3	2·4
04	2 46·0	2 46·5	2 38·4	0·4	0·1	6·4	1·2	12·4	2·4
05	2 46·3	2 46·7	2 38·7	0·5	0·1	6·5	1·2	12·5	2·4
06	2 46·5	2 47·0	2 38·9	0·6	0·1	6·6	1·3	12·6	2·4
07	2 46·8	2 47·2	2 39·2	0·7	0·1	6·7	1·3	12·7	2·4
08	2 47·0	2 47·5	2 39·4	0·8	0·2	6·8	1·3	12·8	2·5
09	2 47·3	2 47·7	2 39·6	0·9	0·2	6·9	1·3	12·9	2·5
10	2 47·5	2 48·0	2 39·9	1·0	0·2	7·0	1·3	13·0	2·5
11	2 47·8	2 48·2	2 40·1	1·1	0·2	7·1	1·4	13·1	2·5
12	2 48·0	2 48·5	2 40·3	1·2	0·2	7·2	1·4	13·2	2·5
13	2 48·3	2 48·7	2 40·6	1·3	0·2	7·3	1·4	13·3	2·5
14	2 48·5	2 49·0	2 40·8	1·4	0·3	7·4	1·4	13·4	2·6
15	2 48·8	2 49·2	2 41·1	1·5	0·3	7·5	1·4	13·5	2·6
16	2 49·0	2 49·5	2 41·3	1·6	0·3	7·6	1·5	13·6	2·6
17	2 49·3	2 49·7	2 41·5	1·7	0·3	7·7	1·5	13·7	2·6
18	2 49·5	2 50·0	2 41·8	1·8	0·3	7·8	1·5	13·8	2·6
19	2 49·8	2 50·2	2 42·0	1·9	0·4	7·9	1·5	13·9	2·7
20	2 50·0	2 50·5	2 42·3	2·0	0·4	8·0	1·5	14·0	2·7
21	2 50·3	2 50·7	2 42·5	2·1	0·4	8·1	1·6	14·1	2·7
22	2 50·5	2 51·0	2 42·7	2·2	0·4	8·2	1·6	14·2	2·7
23	2 50·8	2 51·2	2 43·0	2·3	0·4	8·3	1·6	14·3	2·7
24	2 51·0	2 51·5	2 43·2	2·4	0·5	8·4	1·6	14·4	2·8
25	2 51·3	2 51·7	2 43·4	2·5	0·5	8·5	1·6	14·5	2·8
26	2 51·5	2 52·0	2 43·7	2·6	0·5	8·6	1·6	14·6	2·8
27	2 51·8	2 52·2	2 43·9	2·7	0·5	8·7	1·7	14·7	2·8
28	2 52·0	2 52·5	2 44·2	2·8	0·5	8·8	1·7	14·8	2·8
29	2 52·3	2 52·7	2 44·4	2·9	0·6	8·9	1·7	14·9	2·9
30	2 52·5	2 53·0	2 44·6	3·0	0·6	9·0	1·7	15·0	2·9
31	2 52·8	2 53·2	2 44·9	3·1	0·6	9·1	1·7	15·1	2·9
32	2 53·0	2 53·5	2 45·1	3·2	0·6	9·2	1·8	15·2	2·9
33	2 53·3	2 53·7	2 45·4	3·3	0·6	9·3	1·8	15·3	2·9
34	2 53·5	2 54·0	2 45·6	3·4	0·7	9·4	1·8	15·4	3·0
35	2 53·8	2 54·2	2 45·8	3·5	0·7	9·5	1·8	15·5	3·0
36	2 54·0	2 54·5	2 46·1	3·6	0·7	9·6	1·8	15·6	3·0
37	2 54·3	2 54·7	2 46·3	3·7	0·7	9·7	1·9	15·7	3·0
38	2 54·5	2 55·0	2 46·6	3·8	0·7	9·8	1·9	15·8	3·0
39	2 54·8	2 55·2	2 46·8	3·9	0·7	9·9	1·9	15·9	3·0
40	2 55·0	2 55·5	2 47·0	4·0	0·8	10·0	1·9	16·0	3·1
41	2 55·3	2 55·7	2 47·3	4·1	0·8	10·1	1·9	16·1	3·1
42	2 55·5	2 56·0	2 47·5	4·2	0·8	10·2	2·0	16·2	3·1
43	2 55·8	2 56·2	2 47·7	4·3	0·8	10·3	2·0	16·3	3·1
44	2 56·0	2 56·5	2 48·0	4·4	0·8	10·4	2·0	16·4	3·1
45	2 56·3	2 56·7	2 48·2	4·5	0·9	10·5	2·0	16·5	3·2
46	2 56·5	2 57·0	2 48·5	4·6	0·9	10·6	2·0	16·6	3·2
47	2 56·8	2 57·2	2 48·7	4·7	0·9	10·7	2·1	16·7	3·2
48	2 57·0	2 57·5	2 48·9	4·8	0·9	10·8	2·1	16·8	3·2
49	2 57·3	2 57·7	2 49·2	4·9	0·9	10·9	2·1	16·9	3·2
50	2 57·5	2 58·0	2 49·4	5·0	1·0	11·0	2·1	17·0	3·3
51	2 57·8	2 58·2	2 49·7	5·1	1·0	11·1	2·1	17·1	3·3
52	2 58·0	2 58·5	2 49·9	5·2	1·0	11·2	2·1	17·2	3·3
53	2 58·3	2 58·7	2 50·1	5·3	1·0	11·3	2·2	17·3	3·3
54	2 58·5	2 59·0	2 50·4	5·4	1·0	11·4	2·2	17·4	3·3
55	2 58·8	2 59·2	2 50·6	5·5	1·1	11·5	2·2	17·5	3·4
56	2 59·0	2 59·5	2 50·8	5·6	1·1	11·6	2·2	17·6	3·4
57	2 59·3	2 59·7	2 51·1	5·7	1·1	11·7	2·2	17·7	3·4
58	2 59·5	3 00·0	2 51·3	5·8	1·1	11·8	2·3	17·8	3·4
59	2 59·8	3 00·2	2 51·6	5·9	1·1	11·9	2·3	17·9	3·4
60	3 00·0	3 00·5	2 51·8	6·0	1·2	12·0	2·3	18·0	3·5

12m	SOL PLANETAS	ARIES	LUNA	v o d	Corrn	v o d	Corrn	v o d	Corrn
s	° ′	° ′	° ′	′	′	′	′	′	′
00	3 00·0	3 00·5	2 51·8	0·0	0·0	6·0	1·3	12·0	2·5
01	3 00·3	3 00·7	2 52·0	0·1	0·0	6·1	1·3	12·1	2·5
02	3 00·5	3 01·0	2 52·3	0·2	0·0	6·2	1·3	12·2	2·5
03	3 00·8	3 01·2	2 52·5	0·3	0·1	6·3	1·3	12·3	2·6
04	3 01·0	3 01·5	2 52·8	0·4	0·1	6·4	1·3	12·4	2·6
05	3 01·3	3 01·7	2 53·0	0·5	0·1	6·5	1·4	12·5	2·6
06	3 01·5	3 02·0	2 53·2	0·6	0·1	6·6	1·4	12·6	2·6
07	3 01·8	3 02·2	2 53·5	0·7	0·1	6·7	1·4	12·7	2·6
08	3 02·0	3 02·5	2 53·7	0·8	0·2	6·8	1·4	12·8	2·7
09	3 02·3	3 02·7	2 53·9	0·9	0·2	6·9	1·4	12·9	2·7
10	3 02·5	3 03·0	2 54·2	1·0	0·2	7·0	1·5	13·0	2·7
11	3 02·8	3 03·3	2 54·4	1·1	0·2	7·1	1·5	13·1	2·7
12	3 03·0	3 03·5	2 54·7	1·2	0·3	7·2	1·5	13·2	2·8
13	3 03·3	3 03·8	2 54·9	1·3	0·3	7·3	1·5	13·3	2·8
14	3 03·5	3 04·0	2 55·1	1·4	0·3	7·4	1·5	13·4	2·8
15	3 03·8	3 04·3	2 55·4	1·5	0·3	7·5	1·6	13·5	2·8
16	3 04·0	3 04·5	2 55·6	1·6	0·3	7·6	1·6	13·6	2·8
17	3 04·3	3 04·8	2 55·9	1·7	0·4	7·7	1·6	13·7	2·9
18	3 04·5	3 05·0	2 56·1	1·8	0·4	7·8	1·6	13·8	2·9
19	3 04·8	3 05·3	2 56·3	1·9	0·4	7·9	1·6	13·9	2·9
20	3 05·0	3 05·5	2 56·6	2·0	0·4	8·0	1·7	14·0	2·9
21	3 05·3	3 05·8	2 56·8	2·1	0·4	8·1	1·7	14·1	2·9
22	3 05·5	3 06·0	2 57·0	2·2	0·5	8·2	1·7	14·2	3·0
23	3 05·8	3 06·3	2 57·3	2·3	0·5	8·3	1·7	14·3	3·0
24	3 06·0	3 06·5	2 57·5	2·4	0·5	8·4	1·8	14·4	3·0
25	3 06·3	3 06·8	2 57·8	2·5	0·5	8·5	1·8	14·5	3·0
26	3 06·5	3 07·0	2 58·0	2·6	0·5	8·6	1·8	14·6	3·0
27	3 06·8	3 07·3	2 58·2	2·7	0·6	8·7	1·8	14·7	3·1
28	3 07·0	3 07·5	2 58·5	2·8	0·6	8·8	1·8	14·8	3·1
29	3 07·3	3 07·8	2 58·7	2·9	0·6	8·9	1·9	14·9	3·1
30	3 07·5	3 08·0	2 59·0	3·0	0·6	9·0	1·9	15·0	3·1
31	3 07·8	3 08·3	2 59·2	3·1	0·6	9·1	1·9	15·1	3·1
32	3 08·0	3 08·5	2 59·4	3·2	0·7	9·2	1·9	15·2	3·2
33	3 08·3	3 08·8	2 59·7	3·3	0·7	9·3	1·9	15·3	3·2
34	3 08·5	3 09·0	2 59·9	3·4	0·7	9·4	2·0	15·4	3·2
35	3 08·8	3 09·3	3 00·2	3·5	0·7	9·5	2·0	15·5	3·2
36	3 09·0	3 09·5	3 00·4	3·6	0·8	9·6	2·0	15·6	3·3
37	3 09·3	3 09·8	3 00·6	3·7	0·8	9·7	2·0	15·7	3·3
38	3 09·5	3 10·0	3 00·9	3·8	0·8	9·8	2·0	15·8	3·3
39	3 09·8	3 10·3	3 01·1	3·9	0·8	9·9	2·1	15·9	3·3
40	3 10·0	3 10·5	3 01·3	4·0	0·8	10·0	2·1	16·0	3·3
41	3 10·3	3 10·8	3 01·6	4·1	0·9	10·1	2·1	16·1	3·4
42	3 10·5	3 11·0	3 01·8	4·2	0·9	10·2	2·1	16·2	3·4
43	3 10·8	3 11·3	3 02·1	4·3	0·9	10·3	2·1	16·3	3·4
44	3 11·0	3 11·5	3 02·3	4·4	0·9	10·4	2·2	16·4	3·4
45	3 11·3	3 11·8	3 02·5	4·5	0·9	10·5	2·2	16·5	3·4
46	3 11·5	3 12·0	3 02·8	4·6	1·0	10·6	2·2	16·6	3·5
47	3 11·8	3 12·3	3 03·0	4·7	1·0	10·7	2·2	16·7	3·5
48	3 12·0	3 12·5	3 03·3	4·8	1·0	10·8	2·3	16·8	3·5
49	3 12·3	3 12·8	3 03·5	4·9	1·0	10·9	2·3	16·9	3·5
50	3 12·5	3 13·0	3 03·7	5·0	1·0	11·0	2·3	17·0	3·5
51	3 12·8	3 13·3	3 04·0	5·1	1·1	11·1	2·3	17·1	3·6
52	3 13·0	3 13·5	3 04·2	5·2	1·1	11·2	2·3	17·2	3·6
53	3 13·3	3 13·8	3 04·4	5·3	1·1	11·3	2·4	17·3	3·6
54	3 13·5	3 14·0	3 04·7	5·4	1·1	11·4	2·4	17·4	3·6
55	3 13·8	3 14·3	3 04·9	5·5	1·1	11·5	2·4	17·5	3·6
56	3 14·0	3 14·5	3 05·2	5·6	1·2	11·6	2·4	17·6	3·7
57	3 14·3	3 14·8	3 05·4	5·7	1·2	11·7	2·4	17·7	3·7
58	3 14·5	3 15·0	3 05·6	5·8	1·2	11·8	2·5	17·8	3·7
59	3 14·8	3 15·3	3 05·9	5·9	1·2	11·9	2·5	17·9	3·7
60	3 15·0	3 15·5	3 06·1	6·0	1·3	12·0	2·5	18·0	3·8

13m	SOL PLANETAS	ARIES	LUNA	v o d	Corrn	v o d	Corrn	v o d	Corrn
s	° ′	° ′	° ′	′	′	′	′	′	′
00	3 15·0	3 15·5	3 06·1	0·0	0·0	6·0	1·4	12·0	2·7
01	3 15·3	3 15·8	3 06·4	0·1	0·0	6·1	1·4	12·1	2·7
02	3 15·5	3 16·0	3 06·6	0·2	0·0	6·2	1·4	12·2	2·7
03	3 15·8	3 16·3	3 06·8	0·3	0·1	6·3	1·4	12·3	2·8
04	3 16·0	3 16·5	3 07·1	0·4	0·1	6·4	1·4	12·4	2·8
05	3 16·3	3 16·8	3 07·3	0·5	0·1	6·5	1·5	12·5	2·8
06	3 16·5	3 17·0	3 07·5	0·6	0·1	6·6	1·5	12·6	2·8
07	3 16·8	3 17·3	3 07·8	0·7	0·2	6·7	1·5	12·7	2·9
08	3 17·0	3 17·5	3 08·0	0·8	0·2	6·8	1·5	12·8	2·9
09	3 17·3	3 17·8	3 08·3	0·9	0·2	6·9	1·6	12·9	2·9
10	3 17·5	3 18·0	3 08·5	1·0	0·2	7·0	1·6	13·0	2·9
11	3 17·8	3 18·3	3 08·7	1·1	0·2	7·1	1·6	13·1	2·9
12	3 18·0	3 18·5	3 09·0	1·2	0·3	7·2	1·6	13·2	3·0
13	3 18·3	3 18·8	3 09·2	1·3	0·3	7·3	1·6	13·3	3·0
14	3 18·5	3 19·0	3 09·5	1·4	0·3	7·4	1·7	13·4	3·0
15	3 18·8	3 19·3	3 09·7	1·5	0·3	7·5	1·7	13·5	3·0
16	3 19·0	3 19·5	3 09·9	1·6	0·4	7·6	1·7	13·6	3·1
17	3 19·3	3 19·8	3 10·2	1·7	0·4	7·7	1·7	13·7	3·1
18	3 19·5	3 20·0	3 10·4	1·8	0·4	7·8	1·8	13·8	3·1
19	3 19·8	3 20·3	3 10·7	1·9	0·4	7·9	1·8	13·9	3·1
20	3 20·0	3 20·5	3 10·9	2·0	0·5	8·0	1·8	14·0	3·2
21	3 20·3	3 20·8	3 11·1	2·1	0·5	8·1	1·8	14·1	3·2
22	3 20·5	3 21·0	3 11·4	2·2	0·5	8·2	1·8	14·2	3·2
23	3 20·8	3 21·3	3 11·6	2·3	0·5	8·3	1·9	14·3	3·2
24	3 21·0	3 21·6	3 11·8	2·4	0·5	8·4	1·9	14·4	3·2
25	3 21·3	3 21·8	3 12·1	2·5	0·6	8·5	1·9	14·5	3·3
26	3 21·5	3 22·1	3 12·3	2·6	0·6	8·6	1·9	14·6	3·3
27	3 21·8	3 22·3	3 12·6	2·7	0·6	8·7	2·0	14·7	3·3
28	3 22·0	3 22·6	3 12·8	2·8	0·6	8·8	2·0	14·8	3·3
29	3 22·3	3 22·8	3 13·0	2·9	0·7	8·9	2·0	14·9	3·4
30	3 22·5	3 23·1	3 13·3	3·0	0·7	9·0	2·0	15·0	3·4
31	3 22·8	3 23·3	3 13·5	3·1	0·7	9·1	2·0	15·1	3·4
32	3 23·0	3 23·6	3 13·8	3·2	0·7	9·2	2·1	15·2	3·4
33	3 23·3	3 23·8	3 14·0	3·3	0·7	9·3	2·1	15·3	3·4
34	3 23·5	3 24·1	3 14·2	3·4	0·8	9·4	2·1	15·4	3·5
35	3 23·8	3 24·3	3 14·5	3·5	0·8	9·5	2·1	15·5	3·5
36	3 24·0	3 24·6	3 14·7	3·6	0·8	9·6	2·2	15·6	3·5
37	3 24·3	3 24·8	3 14·9	3·7	0·8	9·7	2·2	15·7	3·5
38	3 24·5	3 25·1	3 15·2	3·8	0·9	9·8	2·2	15·8	3·6
39	3 24·8	3 25·3	3 15·4	3·9	0·9	9·9	2·2	15·9	3·6
40	3 25·0	3 25·6	3 15·7	4·0	0·9	10·0	2·3	16·0	3·6
41	3 25·3	3 25·8	3 15·9	4·1	0·9	10·1	2·3	16·1	3·6
42	3 25·5	3 26·1	3 16·1	4·2	0·9	10·2	2·3	16·2	3·6
43	3 25·8	3 26·3	3 16·4	4·3	1·0	10·3	2·3	16·3	3·7
44	3 26·0	3 26·6	3 16·6	4·4	1·0	10·4	2·3	16·4	3·7
45	3 26·3	3 26·8	3 16·9	4·5	1·0	10·5	2·4	16·5	3·7
46	3 26·5	3 27·1	3 17·1	4·6	1·0	10·6	2·4	16·6	3·7
47	3 26·8	3 27·3	3 17·3	4·7	1·1	10·7	2·4	16·7	3·8
48	3 27·0	3 27·6	3 17·6	4·8	1·1	10·8	2·4	16·8	3·8
49	3 27·3	3 27·8	3 17·8	4·9	1·1	10·9	2·5	16·9	3·8
50	3 27·5	3 28·1	3 18·0	5·0	1·1	11·0	2·5	17·0	3·8
51	3 27·8	3 28·3	3 18·3	5·1	1·1	11·1	2·5	17·1	3·8
52	3 28·0	3 28·6	3 18·5	5·2	1·2	11·2	2·5	17·2	3·9
53	3 28·3	3 28·8	3 18·8	5·3	1·2	11·3	2·5	17·3	3·9
54	3 28·5	3 29·1	3 19·0	5·4	1·2	11·4	2·6	17·4	3·9
55	3 28·8	3 29·3	3 19·2	5·5	1·2	11·5	2·6	17·5	3·9
56	3 29·0	3 29·6	3 19·5	5·6	1·3	11·6	2·6	17·6	4·0
57	3 29·3	3 29·8	3 19·7	5·7	1·3	11·7	2·6	17·7	4·0
58	3 29·5	3 30·1	3 20·0	5·8	1·3	11·8	2·7	17·8	4·0
59	3 29·8	3 30·3	3 20·2	5·9	1·3	11·9	2·7	17·9	4·0
60	3 30·0	3 30·6	3 20·4	6·0	1·4	12·0	2·7	18·0	4·1

m 14	SOL PLANETAS	ARIES	LUNA	v o d Corrn		v o d Corrn		v o d Corrn	
s	° ′	° ′	° ′	′	′	′	′	′	′
00	3 30·0	3 30·6	3 20·4	0·0	0·0	6·0	1·5	12·0	2·9
01	3 30·3	3 30·8	3 20·7	0·1	0·0	6·1	1·5	12·1	2·9
02	3 30·5	3 31·1	3 20·9	0·2	0·0	6·2	1·5	12·2	2·9
03	3 30·8	3 31·3	3 21·1	0·3	0·1	6·3	1·5	12·3	3·0
04	3 31·0	3 31·6	3 21·4	0·4	0·1	6·4	1·5	12·4	3·0
05	3 31·3	3 31·8	3 21·6	0·5	0·1	6·5	1·6	12·5	3·0
06	3 31·5	3 32·1	3 21·9	0·6	0·1	6·6	1·6	12·6	3·0
07	3 31·8	3 32·3	3 22·1	0·7	0·2	6·7	1·6	12·7	3·1
08	3 32·0	3 32·6	3 22·3	0·8	0·2	6·8	1·6	12·8	3·1
09	3 32·3	3 32·8	3 22·6	0·9	0·2	6·9	1·7	12·9	3·1
10	3 32·5	3 33·1	3 22·8	1·0	0·2	7·0	1·7	13·0	3·1
11	3 32·8	3 33·3	3 23·1	1·1	0·3	7·1	1·7	13·1	3·2
12	3 33·0	3 33·6	3 23·3	1·2	0·3	7·2	1·7	13·2	3·2
13	3 33·3	3 33·8	3 23·5	1·3	0·3	7·3	1·8	13·3	3·2
14	3 33·5	3 34·1	3 23·8	1·4	0·3	7·4	1·8	13·4	3·2
15	3 33·8	3 34·3	3 24·0	1·5	0·4	7·5	1·8	13·5	3·3
16	3 34·0	3 34·6	3 24·3	1·6	0·4	7·6	1·8	13·6	3·3
17	3 34·3	3 34·8	3 24·5	1·7	0·4	7·7	1·9	13·7	3·3
18	3 34·5	3 35·1	3 24·7	1·8	0·4	7·8	1·9	13·8	3·3
19	3 34·8	3 35·3	3 25·0	1·9	0·5	7·9	1·9	13·9	3·4
20	3 35·0	3 35·6	3 25·2	2·0	0·5	8·0	1·9	14·0	3·4
21	3 35·3	3 35·8	3 25·4	2·1	0·5	8·1	2·0	14·1	3·4
22	3 35·5	3 36·1	3 25·7	2·2	0·5	8·2	2·0	14·2	3·4
23	3 35·8	3 36·3	3 25·9	2·3	0·6	8·3	2·0	14·3	3·5
24	3 36·0	3 36·6	3 26·2	2·4	0·6	8·4	2·0	14·4	3·5
25	3 36·3	3 36·8	3 26·4	2·5	0·6	8·5	2·1	14·5	3·5
26	3 36·5	3 37·1	3 26·6	2·6	0·6	8·6	2·1	14·6	3·5
27	3 36·8	3 37·3	3 26·9	2·7	0·7	8·7	2·1	14·7	3·6
28	3 37·0	3 37·6	3 27·1	2·8	0·7	8·8	2·1	14·8	3·6
29	3 37·3	3 37·8	3 27·4	2·9	0·7	8·9	2·2	14·9	3·6
30	3 37·5	3 38·1	3 27·6	3·0	0·7	9·0	2·2	15·0	3·6
31	3 37·8	3 38·3	3 27·8	3·1	0·7	9·1	2·2	15·1	3·6
32	3 38·0	3 38·6	3 28·1	3·2	0·8	9·2	2·2	15·2	3·7
33	3 38·3	3 38·8	3 28·3	3·3	0·8	9·3	2·2	15·3	3·7
34	3 38·5	3 39·1	3 28·5	3·4	0·8	9·4	2·3	15·4	3·7
35	3 38·8	3 39·3	3 28·8	3·5	0·8	9·5	2·3	15·5	3·7
36	3 39·0	3 39·6	3 29·0	3·6	0·9	9·6	2·3	15·6	3·8
37	3 39·3	3 39·9	3 29·3	3·7	0·9	9·7	2·3	15·7	3·8
38	3 39·5	3 40·1	3 29·5	3·8	0·9	9·8	2·4	15·8	3·8
39	3 39·8	3 40·4	3 29·7	3·9	0·9	9·9	2·4	15·9	3·8
40	3 40·0	3 40·6	3 30·0	4·0	1·0	10·0	2·4	16·0	3·9
41	3 40·3	3 40·9	3 30·2	4·1	1·0	10·1	2·4	16·1	3·9
42	3 40·5	3 41·1	3 30·5	4·2	1·0	10·2	2·5	16·2	3·9
43	3 40·8	3 41·4	3 30·7	4·3	1·0	10·3	2·5	16·3	3·9
44	3 41·0	3 41·6	3 30·9	4·4	1·1	10·4	2·5	16·4	4·0
45	3 41·3	3 41·9	3 31·2	4·5	1·1	10·5	2·5	16·5	4·0
46	3 41·5	3 42·1	3 31·4	4·6	1·1	10·6	2·6	16·6	4·0
47	3 41·8	3 42·4	3 31·6	4·7	1·1	10·7	2·6	16·7	4·0
48	3 42·0	3 42·6	3 31·9	4·8	1·2	10·8	2·6	16·8	4·1
49	3 42·3	3 42·9	3 32·1	4·9	1·2	10·9	2·6	16·9	4·1
50	3 42·5	3 43·1	3 32·4	5·0	1·2	11·0	2·7	17·0	4·1
51	3 42·8	3 43·4	3 32·6	5·1	1·2	11·1	2·7	17·1	4·1
52	3 43·0	3 43·6	3 32·8	5·2	1·3	11·2	2·7	17·2	4·2
53	3 43·3	3 43·9	3 33·1	5·3	1·3	11·3	2·7	17·3	4·2
54	3 43·5	3 44·1	3 33·3	5·4	1·3	11·4	2·8	17·4	4·2
55	3 43·8	3 44·4	3 33·6	5·5	1·3	11·5	2·8	17·5	4·2
56	3 44·0	3 44·6	3 33·8	5·6	1·4	11·6	2·8	17·6	4·3
57	3 44·3	3 44·9	3 34·0	5·7	1·4	11·7	2·8	17·7	4·3
58	3 44·5	3 45·1	3 34·3	5·8	1·4	11·8	2·9	17·8	4·3
59	3 44·8	3 45·4	3 34·5	5·9	1·4	11·9	2·9	17·9	4·3
60	3 45·0	3 45·6	3 34·8	6·0	1·5	12·0	2·9	18·0	4·4

m 15	SOL PLANETAS	ARIES	LUNA	v o d Corrn		v o d Corrn		v o d Corrn	
s	° ′	° ′	° ′	′	′	′	′	′	′
00	3 45·0	3 45·6	3 34·8	0·0	0·0	6·0	1·6	12·0	3·1
01	3 45·3	3 45·9	3 35·0	0·1	0·0	6·1	1·6	12·1	3·1
02	3 45·5	3 46·1	3 35·2	0·2	0·1	6·2	1·6	12·2	3·2
03	3 45·8	3 46·4	3 35·5	0·3	0·1	6·3	1·6	12·3	3·2
04	3 46·0	3 46·6	3 35·7	0·4	0·1	6·4	1·7	12·4	3·2
05	3 46·3	3 46·9	3 35·9	0·5	0·1	6·5	1·7	12·5	3·2
06	3 46·5	3 47·1	3 36·2	0·6	0·2	6·6	1·7	12·6	3·3
07	3 46·8	3 47·4	3 36·4	0·7	0·2	6·7	1·7	12·7	3·3
08	3 47·0	3 47·6	3 36·7	0·8	0·2	6·8	1·8	12·8	3·3
09	3 47·3	3 47·9	3 36·9	0·9	0·2	6·9	1·8	12·9	3·3
10	3 47·5	3 48·1	3 37·1	1·0	0·3	7·0	1·8	13·0	3·4
11	3 47·8	3 48·4	3 37·4	1·1	0·3	7·1	1·8	13·1	3·4
12	3 48·0	3 48·6	3 37·6	1·2	0·3	7·2	1·9	13·2	3·4
13	3 48·3	3 48·9	3 37·9	1·3	0·3	7·3	1·9	13·3	3·4
14	3 48·5	3 49·1	3 38·1	1·4	0·4	7·4	1·9	13·4	3·5
15	3 48·8	3 49·4	3 38·3	1·5	0·4	7·5	1·9	13·5	3·5
16	3 49·0	3 49·6	3 38·6	1·6	0·4	7·6	2·0	13·6	3·5
17	3 49·3	3 49·9	3 38·8	1·7	0·4	7·7	2·0	13·7	3·5
18	3 49·5	3 50·1	3 39·0	1·8	0·5	7·8	2·0	13·8	3·6
19	3 49·8	3 50·4	3 39·3	1·9	0·5	7·9	2·0	13·9	3·6
20	3 50·0	3 50·6	3 39·5	2·0	0·5	8·0	2·1	14·0	3·6
21	3 50·3	3 50·9	3 39·8	2·1	0·5	8·1	2·1	14·1	3·6
22	3 50·5	3 51·1	3 40·0	2·2	0·6	8·2	2·1	14·2	3·7
23	3 50·8	3 51·4	3 40·2	2·3	0·6	8·3	2·1	14·3	3·7
24	3 51·0	3 51·6	3 40·5	2·4	0·6	8·4	2·2	14·4	3·7
25	3 51·3	3 51·9	3 40·7	2·5	0·6	8·5	2·2	14·5	3·7
26	3 51·5	3 52·1	3 41·0	2·6	0·7	8·6	2·2	14·6	3·8
27	3 51·8	3 52·4	3 41·2	2·7	0·7	8·7	2·2	14·7	3·8
28	3 52·0	3 52·6	3 41·4	2·8	0·7	8·8	2·3	14·8	3·8
29	3 52·3	3 52·9	3 41·7	2·9	0·7	8·9	2·3	14·9	3·8
30	3 52·5	3 53·1	3 41·9	3·0	0·8	9·0	2·3	15·0	3·9
31	3 52·8	3 53·4	3 42·1	3·1	0·8	9·1	2·4	15·1	3·9
32	3 53·0	3 53·6	3 42·4	3·2	0·8	9·2	2·4	15·2	3·9
33	3 53·3	3 53·9	3 42·6	3·3	0·9	9·3	2·4	15·3	4·0
34	3 53·5	3 54·1	3 42·9	3·4	0·9	9·4	2·4	15·4	4·0
35	3 53·8	3 54·4	3 43·1	3·5	0·9	9·5	2·5	15·5	4·0
36	3 54·0	3 54·6	3 43·3	3·6	0·9	9·6	2·5	15·6	4·0
37	3 54·3	3 54·9	3 43·6	3·7	1·0	9·7	2·5	15·7	4·1
38	3 54·5	3 55·1	3 43·8	3·8	1·0	9·8	2·5	15·8	4·1
39	3 54·8	3 55·4	3 44·1	3·9	1·0	9·9	2·6	15·9	4·1
40	3 55·0	3 55·6	3 44·3	4·0	1·0	10·0	2·6	16·0	4·1
41	3 55·3	3 55·9	3 44·5	4·1	1·1	10·1	2·6	16·1	4·2
42	3 55·5	3 56·1	3 44·8	4·2	1·1	10·2	2·6	16·2	4·2
43	3 55·8	3 56·4	3 45·0	4·3	1·1	10·3	2·7	16·3	4·2
44	3 56·0	3 56·6	3 45·2	4·4	1·1	10·4	2·7	16·4	4·2
45	3 56·3	3 56·9	3 45·5	4·5	1·2	10·5	2·7	16·5	4·3
46	3 56·5	3 57·1	3 45·7	4·6	1·2	10·6	2·7	16·6	4·3
47	3 56·8	3 57·4	3 46·0	4·7	1·2	10·7	2·8	16·7	4·3
48	3 57·0	3 57·6	3 46·2	4·8	1·2	10·8	2·8	16·8	4·3
49	3 57·3	3 57·9	3 46·4	4·9	1·3	10·9	2·8	16·9	4·4
50	3 57·5	3 58·2	3 46·7	5·0	1·3	11·0	2·8	17·0	4·4
51	3 57·8	3 58·4	3 46·9	5·1	1·3	11·1	2·9	17·1	4·4
52	3 58·0	3 58·7	3 47·2	5·2	1·3	11·2	2·9	17·2	4·4
53	3 58·3	3 58·9	3 47·4	5·3	1·4	11·3	2·9	17·3	4·5
54	3 58·5	3 59·2	3 47·6	5·4	1·4	11·4	2·9	17·4	4·5
55	3 58·8	3 59·4	3 47·9	5·5	1·4	11·5	3·0	17·5	4·5
56	3 59·0	3 59·7	3 48·1	5·6	1·4	11·6	3·0	17·6	4·5
57	3 59·3	3 59·9	3 48·4	5·7	1·5	11·7	3·0	17·7	4·6
58	3 59·5	4 00·2	3 48·6	5·8	1·5	11·8	3·0	17·8	4·6
59	3 59·8	4 00·4	3 48·8	5·9	1·5	11·9	3·1	17·9	4·6
60	4 00·0	4 00·7	3 49·1	6·0	1·6	12·0	3·1	18·0	4·7

16m	SOL PLANETAS	ARIES	LUNA	v o d Corrn		v o d Corrn		v o d Corrn	
s	° ′	° ′	° ′	′	′	′	′	′	′
00	4 00·0	4 00·7	3 49·1	0·0	0·0	6·0	1·7	12·0	3·3
01	4 00·3	4 00·9	3 49·3	0·1	0·0	6·1	1·7	12·1	3·3
02	4 00·5	4 01·2	3 49·5	0·2	0·1	6·2	1·7	12·2	3·4
03	4 00·8	4 01·4	3 49·8	0·3	0·1	6·3	1·7	12·3	3·4
04	4 01·0	4 01·7	3 50·0	0·4	0·1	6·4	1·8	12·4	3·4
05	4 01·3	4 01·9	3 50·3	0·5	0·1	6·5	1·8	12·5	3·4
06	4 01·5	4 02·2	3 50·5	0·6	0·2	6·6	1·8	12·6	3·5
07	4 01·8	4 02·4	3 50·7	0·7	0·2	6·7	1·8	12·7	3·5
08	4 02·0	4 02·7	3 51·0	0·8	0·2	6·8	1·9	12·8	3·5
09	4 02·3	4 02·9	3 51·2	0·9	0·2	6·9	1·9	12·9	3·5
10	4 02·5	4 03·2	3 51·5	1·0	0·3	7·0	1·9	13·0	3·6
11	4 02·8	4 03·4	3 51·7	1·1	0·3	7·1	2·0	13·1	3·6
12	4 03·0	4 03·7	3 51·9	1·2	0·3	7·2	2·0	13·2	3·6
13	4 03·3	4 03·9	3 52·2	1·3	0·4	7·3	2·0	13·3	3·7
14	4 03·5	4 04·2	3 52·4	1·4	0·4	7·4	2·0	13·4	3·7
15	4 03·8	4 04·4	3 52·6	1·5	0·4	7·5	2·1	13·5	3·7
16	4 04·0	4 04·7	3 52·9	1·6	0·4	7·6	2·1	13·6	3·7
17	4 04·3	4 04·9	3 53·1	1·7	0·5	7·7	2·1	13·7	3·8
18	4 04·5	4 05·2	3 53·4	1·8	0·5	7·8	2·1	13·8	3·8
19	4 04·8	4 05·4	3 53·6	1·9	0·5	7·9	2·2	13·9	3·8
20	4 05·0	4 05·7	3 53·8	2·0	0·6	8·0	2·2	14·0	3·9
21	4 05·3	4 05·9	3 54·1	2·1	0·6	8·1	2·2	14·1	3·9
22	4 05·5	4 06·2	3 54·3	2·2	0·6	8·2	2·3	14·2	3·9
23	4 05·8	4 06·4	3 54·6	2·3	0·6	8·3	2·3	14·3	3·9
24	4 06·0	4 06·7	3 54·8	2·4	0·7	8·4	2·3	14·4	4·0
25	4 06·3	4 06·9	3 55·0	2·5	0·7	8·5	2·3	14·5	4·0
26	4 06·5	4 07·2	3 55·3	2·6	0·7	8·6	2·4	14·6	4·0
27	4 06·8	4 07·4	3 55·5	2·7	0·7	8·7	2·4	14·7	4·0
28	4 07·0	4 07·7	3 55·7	2·8	0·8	8·8	2·4	14·8	4·1
29	4 07·3	4 07·9	3 56·0	2·9	0·8	8·9	2·4	14·9	4·1
30	4 07·5	4 08·2	3 56·2	3·0	0·8	9·0	2·5	15·0	4·1
31	4 07·8	4 08·4	3 56·5	3·1	0·9	9·1	2·5	15·1	4·2
32	4 08·0	4 08·7	3 56·7	3·2	0·9	9·2	2·5	15·2	4·2
33	4 08·3	4 08·9	3 56·9	3·3	0·9	9·3	2·6	15·3	4·2
34	4 08·5	4 09·2	3 57·2	3·4	0·9	9·4	2·6	15·4	4·2
35	4 08·8	4 09·4	3 57·4	3·5	1·0	9·5	2·6	15·5	4·3
36	4 09·0	4 09·7	3 57·7	3·6	1·0	9·6	2·6	15·6	4·3
37	4 09·3	4 09·9	3 57·9	3·7	1·0	9·7	2·7	15·7	4·3
38	4 09·5	4 10·2	3 58·1	3·8	1·0	9·8	2·7	15·8	4·3
39	4 09·8	4 10·4	3 58·4		1·1	9·9	2·7	15·9	4·4
40	4 10·0	4 10·7	3 58·6	4·0	1·1	10·0	2·8	16·0	4·4
41	4 10·3	4 10·9	3 58·8	4·1	1·1	10·1	2·8	16·1	4·4
42	4 10·5	4 11·2	3 59·1	4·2	1·2	10·2	2·8	16·2	4·5
43	4 10·8	4 11·4	3 59·3	4·3	1·2	10·3	2·8	16·3	4·5
44	4 11·0	4 11·7	3 59·6	4·4	1·2	10·4	2·9	16·4	4·5
45	4 11·3	4 11·9	3 59·8	4·5	1·2	10·5	2·9	16·5	4·5
46	4 11·5	4 12·2	4 00·0	4·6	1·3	10·6	2·9	16·6	4·6
47	4 11·8	4 12·4	4 00·3	4·7	1·3	10·7	2·9	16·7	4·6
48	4 12·0	4 12·7	4 00·5	4·8	1·3	10·8	3·0	16·8	4·6
49	4 12·3	4 12·9	4 00·8	4·9	1·3	10·9	3·0	16·9	4·6
50	4 12·5	4 13·2	4 01·0	5·0	1·4	11·0	3·0	17·0	4·7
51	4 12·8	4 13·4	4 01·2	5·1	1·4	11·1	3·1	17·1	4·7
52	4 13·0	4 13·7	4 01·5	5·2	1·4	11·2	3·1	17·2	4·7
53	4 13·3	4 13·9	4 01·7	5·3	1·5	11·3	3·1	17·3	4·8
54	4 13·5	4 14·2	4 02·0	5·4	1·5	11·4	3·1	17·4	4·8
55	4 13·8	4 14·4	4 02·2	5·5	1·5	11·5	3·2	17·5	4·8
56	4 14·0	4 14·7	4 02·4	5·6	1·5	11·6	3·2	17·6	4·8
57	4 14·3	4 14·9	4 02·7	5·7	1·6	11·7	3·2	17·7	4·9
58	4 14·5	4 15·2	4 02·9	5·8	1·6	11·8	3·2	17·8	4·9
59	4 14·8	4 15·4	4 03·1	5·9	1·6	11·9	3·3	17·9	4·9
60	4 15·0	4 15·7	4 03·4	6·0	1·7	12·0	3·3	18·0	5·0

17m	SOL PLANETAS	ARIES	LUNA	v o d Corrn		v o d Corrn		v o d Corrn	
s	° ′	° ′	° ′	′	′	′	′	′	′
00	4 15·0	4 15·7	4 03·4	0·0	0·0	6·0	1·8	12·0	3·5
01	4 15·3	4 15·9	4 03·6	0·1	0·0	6·1	1·8	12·1	3·5
02	4 15·5	4 16·2	4 03·9	0·2	0·1	6·2	1·8	12·2	3·6
03	4 15·8	4 16·5	4 04·1	0·3	0·1	6·3	1·8	12·3	3·6
04	4 16·0	4 16·7	4 04·3	0·4	0·1	6·4	1·9	12·4	3·6
05	4 16·3	4 17·0	4 04·6	0·5	0·1	6·5	1·9	12·5	3·6
06	4 16·5	4 17·2	4 04·8	0·6	0·2	6·6	1·9	12·6	3·7
07	4 16·8	4 17·5	4 05·1	0·7	0·2	6·7	2·0	12·7	3·7
08	4 17·0	4 17·7	4 05·3	0·8	0·2	6·8	2·0	12·8	3·7
09	4 17·3	4 18·0	4 05·5	0·9	0·3	6·9	2·0	12·9	3·8
10	4 17·5	4 18·2	4 05·8	1·0	0·3	7·0	2·0	13·0	3·8
11	4 17·8	4 18·5	4 06·0	1·1	0·3	7·1	2·1	13·1	3·8
12	4 18·0	4 18·7	4 06·2	1·2	0·4	7·2	2·1	13·2	3·9
13	4 18·3	4 19·0	4 06·5	1·3	0·4	7·3	2·1	13·3	3·9
14	4 18·5	4 19·2	4 06·7	1·4	0·4	7·4	2·2	13·4	3·9
15	4 18·8	4 19·5	4 07·0	1·5	0·4	7·5	2·2	13·5	3·9
16	4 19·0	4 19·7	4 07·2	1·6	0·5	7·6	2·2	13·6	4·0
17	4 19·3	4 20·0	4 07·4	1·7	0·5	7·7	2·2	13·7	4·0
18	4 19·5	4 20·2	4 07·7	1·8	0·5	7·8	2·3	13·8	4·0
19	4 19·8	4 20·5	4 07·9	1·9	0·6	7·9	2·3	13·9	4·1
20	4 20·0	4 20·7	4 08·2	2·0	0·6	8·0	2·3	14·0	4·1
21	4 20·3	4 21·0	4 08·4	2·1	0·6	8·1	2·4	14·1	4·1
22	4 20·5	4 21·2	4 08·6	2·2	0·6	8·2	2·4	14·2	4·1
23	4 20·8	4 21·5	4 08·9	2·3	0·7	8·3	2·4	14·3	4·2
24	4 21·0	4 21·7	4 09·1	2·4	0·7	8·4	2·5	14·4	4·2
25	4 21·3	4 22·0	4 09·3	2·5	0·7	8·5	2·5	14·5	4·2
26	4 21·5	4 22·2	4 09·6	2·6	0·8	8·6	2·5	14·6	4·3
27	4 21·8	4 22·5	4 09·8	2·7	0·8	8·7	2·5	14·7	4·3
28	4 22·0	4 22·7	4 10·1	2·8	0·8	8·8	2·6	14·8	4·3
29	4 22·3	4 23·0	4 10·3	2·9	0·8	8·9	2·6	14·9	4·3
30	4 22·5	4 23·2	4 10·5	3·0	0·9	9·0	2·6	15·0	4·4
31	4 22·8	4 23·5	4 10·8	3·1	0·9	9·1	2·7	15·1	4·4
32	4 23·0	4 23·7	4 11·0	3·2	0·9	9·2	2·7	15·2	4·4
33	4 23·3	4 24·0	4 11·3	3·3	1·0	9·3	2·7	15·3	4·5
34	4 23·5	4 24·2	4 11·5	3·4	1·0	9·4	2·7	15·4	4·5
35	4 23·8	4 24·5	4 11·7	3·5	1·0	9·5	2·8	15·5	4·5
36	4 24·0	4 24·7	4 12·0	3·6	1·1	9·6	2·8	15·6	4·6
37	4 24·3	4 25·0	4 12·2	3·7	1·1	9·7	2·8	15·7	4·6
38	4 24·5	4 25·2	4 12·5	3·8	1·1	9·8	2·9	15·8	4·6
39	4 24·8	4 25·5	4 12·7	3·9	1·1	9·9	2·9	15·9	4·6
40	4 25·0	4 25·7	4 12·9	4·0	1·2	10·0	2·9	16·0	4·7
41	4 25·3	4 26·0	4 13·2	4·1	1·2	10·1	2·9	16·1	4·7
42	4 25·5	4 26·2	4 13·4	4·2	1·2	10·2	3·0	16·2	4·7
43	4 25·8	4 26·5	4 13·6	4·3	1·3	10·3	3·0	16·3	4·8
44	4 26·0	4 26·7	4 13·9	4·4	1·3	10·4	3·0	16·4	4·8
45	4 26·3	4 27·0	4 14·1	4·5	1·3	10·5	3·1	16·5	4·8
46	4 26·5	4 27·2	4 14·4	4·6	1·3	10·6	3·1	16·6	4·8
47	4 26·8	4 27·5	4 14·6	4·7	1·4	10·7	3·1	16·7	4·9
48	4 27·0	4 27·7	4 14·8	4·8	1·4	10·8	3·2	16·8	4·9
49	4 27·3	4 28·0	4 15·1	4·9	1·4	10·9	3·2	16·9	4·9
50	4 27·5	4 28·2	4 15·3	5·0	1·5	11·0	3·2	17·0	5·0
51	4 27·8	4 28·5	4 15·6	5·1	1·5	11·1	3·2	17·1	5·0
52	4 28·0	4 28·7	4 15·8	5·2	1·5	11·2	3·3	17·2	5·0
53	4 28·3	4 29·0	4 16·0	5·3	1·5	11·3	3·3	17·3	5·0
54	4 28·5	4 29·2	4 16·3	5·4	1·6	11·4	3·3	17·4	5·1
55	4 28·8	4 29·5	4 16·5	5·5	1·6	11·5	3·4	17·5	5·1
56	4 29·0	4 29·7	4 16·7	5·6	1·6	11·6	3·4	17·6	5·1
57	4 29·3	4 30·0	4 17·0	5·7	1·7	11·7	3·4	17·7	5·2
58	4 29·5	4 30·2	4 17·2	5·8	1·7	11·8	3·4	17·8	5·2
59	4 29·8	4 30·5	4 17·5	5·9	1·7	11·9	3·5	17·9	5·2
60	4 30·0	4 30·7	4 17·7	6·0	1·8	12·0	3·5	18·0	5·3

18m	SOL PLANETAS	ARIES	LUNA	v o d	Corrn	v o d	Corrn	v o d	Corrn
s	° ′	° ′	° ′	′	′	′	′	′	′
00	4 30·0	4 30·7	4 17·7	0·0	0·0	6·0	1·9	12·0	3·7
01	4 30·3	4 31·0	4 17·9	0·1	0·0	6·1	1·9	12·1	3·7
02	4 30·5	4 31·2	4 18·2	0·2	0·1	6·2	1·9	12·2	3·8
03	4 30·8	4 31·5	4 18·4	0·3	0·1	6·3	1·9	12·3	3·8
04	4 31·0	4 31·7	4 18·7	0·4	0·1	6·4	2·0	12·4	3·8
05	4 31·3	4 32·0	4 18·9	0·5	0·2	6·5	2·0	12·5	3·9
06	4 31·5	4 32·2	4 19·1	0·6	0·2	6·6	2·0	12·6	3·9
07	4 31·8	4 32·5	4 19·4	0·7	0·2	6·7	2·1	12·7	3·9
08	4 32·0	4 32·7	4 19·6	0·8	0·2	6·8	2·1	12·8	3·9
09	4 32·3	4 33·0	4 19·8	0·9	0·3	6·9	2·1	12·9	4·0
10	4 32·5	4 33·2	4 20·1	1·0	0·3	7·0	2·2	13·0	4·0
11	4 32·8	4 33·5	4 20·3	1·1	0·3	7·1	2·2	13·1	4·0
12	4 33·0	4 33·7	4 20·6	1·2	0·4	7·2	2·2	13·2	4·1
13	4 33·3	4 34·0	4 20·8	1·3	0·4	7·3	2·3	13·3	4·1
14	4 33·5	4 34·2	4 21·0	1·4	0·4	7·4	2·3	13·4	4·1
15	4 33·8	4 34·5	4 21·3	1·5	0·5	7·5	2·3	13·5	4·2
16	4 34·0	4 34·8	4 21·5	1·6	0·5	7·6	2·3	13·6	4·2
17	4 34·3	4 35·0	4 21·8	1·7	0·5	7·7	2·4	13·7	4·2
18	4 34·5	4 35·3	4 22·0	1·8	0·6	7·8	2·4	13·8	4·3
19	4 34·8	4 35·5	4 22·2	1·9	0·6	7·9	2·4	13·9	4·3
20	4 35·0	4 35·8	4 22·5	2·0	0·6	8·0	2·5	14·0	4·3
21	4 35·3	4 36·0	4 22·7	2·1	0·6	8·1	2·5	14·1	4·3
22	4 35·5	4 36·3	4 22·9	2·2	0·7	8·2	2·5	14·2	4·4
23	4 35·8	4 36·5	4 23·2	2·3	0·7	8·3	2·6	14·3	4·4
24	4 36·0	4 36·8	4 23·4	2·4	0·7	8·4	2·6	14·4	4·4
25	4 36·3	4 37·0	4 23·7	2·5	0·8	8·5	2·6	14·5	4·5
26	4 36·5	4 37·3	4 23·9	2·6	0·8	8·6	2·7	14·6	4·5
27	4 36·8	4 37·5	4 24·1	2·7	0·8	8·7	2·7	14·7	4·5
28	4 37·0	4 37·8	4 24·4	2·8	0·9	8·8	2·7	14·8	4·6
29	4 37·3	4 38·0	4 24·6	2·9	0·9	8·9	2·7	14·9	4·6
30	4 37·5	4 38·3	4 24·9	3·0	0·9	9·0	2·8	15·0	4·6
31	4 37·8	4 38·5	4 25·1	3·1	1·0	9·1	2·8	15·1	4·7
32	4 38·0	4 38·8	4 25·3	3·2	1·0	9·2	2·8	15·2	4·7
33	4 38·3	4 39·0	4 25·6	3·3	1·0	9·3	2·9	15·3	4·7
34	4 38·5	4 39·3	4 25·8	3·4	1·0	9·4	2·9	15·4	4·7
35	4 38·8	4 39·5	4 26·1	3·5	1·1	9·5	2·9	15·5	4·8
36	4 39·0	4 39·8	4 26·3	3·6	1·1	9·6	3·0	15·6	4·8
37	4 39·3	4 40·0	4 26·5	3·7	1·1	9·7	3·0	15·7	4·8
38	4 39·5	4 40·3	4 26·8	3·8	1·2	9·8	3·0	15·8	4·9
39	4 39·8	4 40·5	4 27·0	3·9	1·2	9·9	3·1	15·9	4·9
40	4 40·0	4 40·8	4 27·2	4·0	1·2	10·0	3·1	16·0	4·9
41	4 40·3	4 41·0	4 27·5	4·1	1·3	10·1	3·1	16·1	5·0
42	4 40·5	4 41·3	4 27·7	4·2	1·3	10·2	3·1	16·2	5·0
43	4 40·8	4 41·5	4 28·0	4·3	1·3	10·3	3·2	16·3	5·0
44	4 41·0	4 41·8	4 28·2	4·4	1·4	10·4	3·2	16·4	5·1
45	4 41·3	4 42·0	4 28·4	4·5	1·4	10·5	3·2	16·5	5·1
46	4 41·5	4 42·3	4 28·7	4·6	1·4	10·6	3·3	16·6	5·1
47	4 41·8	4 42·5	4 28·9	4·7	1·4	10·7	3·3	16·7	5·1
48	4 42·0	4 42·8	4 29·2	4·8	1·5	10·8	3·3	16·8	5·2
49	4 42·3	4 43·0	4 29·4	4·9	1·5	10·9	3·4	16·9	5·2
50	4 42·5	4 43·3	4 29·6	5·0	1·5	11·0	3·4	17·0	5·2
51	4 42·8	4 43·5	4 29·9	5·1	1·6	11·1	3·4	17·1	5·3
52	4 43·0	4 43·8	4 30·1	5·2	1·6	11·2	3·5	17·2	5·3
53	4 43·3	4 44·0	4 30·3	5·3	1·6	11·3	3·5	17·3	5·3
54	4 43·5	4 44·3	4 30·6	5·4	1·7	11·4	3·5	17·4	5·4
55	4 43·8	4 44·5	4 30·8	5·5	1·7	11·5	3·5	17·5	5·4
56	4 44·0	4 44·8	4 31·1	5·6	1·7	11·6	3·6	17·6	5·4
57	4 44·3	4 45·0	4 31·3	5·7	1·8	11·7	3·6	17·7	5·5
58	4 44·5	4 45·3	4 31·5	5·8	1·8	11·8	3·6	17·8	5·5
59	4 44·8	4 45·5	4 31·8	5·9	1·8	11·9	3·7	17·9	5·5
60	4 45·0	4 45·8	4 32·0	6·0	1·9	12·0	3·7	18·0	5·6

19m	SOL PLANETAS	ARIES	LUNA	v o d	Corrn	v o d	Corrn	v o d	Corrn
s	° ′	° ′	° ′	′	′	′	′	′	′
00	4 45·0	4 45·8	4 32·0	0·0	0·0	6·0	2·0	12·0	3·9
01	4 45·3	4 46·0	4 32·3	0·1	0·0	6·1	2·0	12·1	3·9
02	4 45·5	4 46·3	4 32·5	0·2	0·1	6·2	2·0	12·2	4·0
03	4 45·8	4 46·5	4 32·7	0·3	0·1	6·3	2·0	12·3	4·0
04	4 46·0	4 46·8	4 33·0	0·4	0·1	6·4	2·1	12·4	4·0
05	4 46·3	4 47·0	4 33·2	0·5	0·2	6·5	2·1	12·5	4·1
06	4 46·5	4 47·3	4 33·4	0·6	0·2	6·6	2·1	12·6	4·1
07	4 46·8	4 47·5	4 33·7	0·7	0·2	6·7	2·2	12·7	4·1
08	4 47·0	4 47·8	4 33·9	0·8	0·3	6·8	2·2	12·8	4·2
09	4 47·3	4 48·0	4 34·2	0·9	0·3	6·9	2·2	12·9	4·2
10	4 47·5	4 48·3	4 34·4	1·0	0·3	7·0	2·3	13·0	4·2
11	4 47·8	4 48·5	4 34·6	1·1	0·4	7·1	2·3	13·1	4·3
12	4 48·0	4 48·8	4 34·9	1·2	0·4	7·2	2·3	13·2	4·3
13	4 48·3	4 49·0	4 35·1	1·3	0·4	7·3	2·4	13·3	4·3
14	4 48·5	4 49·3	4 35·4	1·4	0·5	7·4	2·4	13·4	4·4
15	4 48·8	4 49·5	4 35·6	1·5	0·5	7·5	2·4	13·5	4·4
16	4 49·0	4 49·8	4 35·8	1·6	0·5	7·6	2·5	13·6	4·4
17	4 49·3	4 50·0	4 36·1	1·7	0·6	7·7	2·5	13·7	4·5
18	4 49·5	4 50·3	4 36·3	1·8	0·6	7·8	2·5	13·8	4·5
19	4 49·8	4 50·5	4 36·6	1·9	0·6	7·9	2·6	13·9	4·5
20	4 50·0	4 50·8	4 36·8	2·0	0·7	8·0	2·6	14·0	4·6
21	4 50·3	4 51·0	4 37·0	2·1	0·7	8·1	2·6	14·1	4·6
22	4 50·5	4 51·3	4 37·3	2·2	0·7	8·2	2·7	14·2	4·6
23	4 50·8	4 51·5	4 37·5	2·3	0·7	8·3	2·7	14·3	4·6
24	4 51·0	4 51·8	4 37·7	2·4	0·8	8·4	2·7	14·4	4·7
25	4 51·3	4 52·0	4 38·0	2·5	0·8	8·5	2·8	14·5	4·7
26	4 51·5	4 52·3	4 38·2	2·6	0·8	8·6	2·8	14·6	4·7
27	4 51·8	4 52·5	4 38·5	2·7	0·9	8·7	2·8	14·7	4·8
28	4 52·0	4 52·8	4 38·7	2·8	0·9	8·8	2·9	14·8	4·8
29	4 52·3	4 53·1	4 38·9	2·9	0·9	8·9	2·9	14·9	4·8
30	4 52·5	4 53·3	4 39·2	3·0	1·0	9·0	2·9	15·0	4·9
31	4 52·8	4 53·6	4 39·4	3·1	1·0	9·1	3·0	15·1	4·9
32	4 53·0	4 53·8	4 39·7	3·2	1·0	9·2	3·0	15·2	4·9
33	4 53·3	4 54·1	4 39·9	3·3	1·1	9·3	3·0	15·3	5·0
34	4 53·5	4 54·3	4 40·1	3·4	1·1	9·4	3·1	15·4	5·0
35	4 53·8	4 54·6	4 40·4	3·5	1·1	9·5	3·1	15·5	5·0
36	4 54·0	4 54·8	4 40·6	3·6	1·2	9·6	3·1	15·6	5·1
37	4 54·3	4 55·1	4 40·8	3·7	1·2	9·7	3·2	15·7	5·1
38	4 54·5	4 55·3	4 41·1	3·8	1·2	9·8	3·2	15·8	5·1
39	4 54·8	4 55·6	4 41·3	3·9	1·3	9·9	3·2	15·9	5·2
40	4 55·0	4 55·8	4 41·6	4·0	1·3	10·0	3·3	16·0	5·2
41	4 55·3	4 56·1	4 41·8	4·1	1·3	10·1	3·3	16·1	5·2
42	4 55·5	4 56·3	4 42·0	4·2	1·4	10·2	3·3	16·2	5·3
43	4 55·8	4 56·6	4 42·3	4·3	1·4	10·3	3·3	16·3	5·3
44	4 56·0	4 56·8	4 42·5	4·4	1·4	10·4	3·4	16·4	5·3
45	4 56·3	4 57·1	4 42·8	4·5	1·5	10·5	3·4	16·5	5·4
46	4 56·5	4 57·3	4 43·0	4·6	1·5	10·6	3·4	16·6	5·4
47	4 56·8	4 57·6	4 43·2	4·7	1·5	10·7	3·5	16·7	5·4
48	4 57·0	4 57·8	4 43·5	4·8	1·6	10·8	3·5	16·8	5·5
49	4 57·3	4 58·1	4 43·7	4·9	1·6	10·9	3·5	16·9	5·5
50	4 57·5	4 58·3	4 43·9	5·0	1·6	11·0	3·6	17·0	5·5
51	4 57·8	4 58·6	4 44·2	5·1	1·7	11·1	3·6	17·1	5·6
52	4 58·0	4 58·8	4 44·4	5·2	1·7	11·2	3·6	17·2	5·6
53	4 58·3	4 59·1	4 44·7	5·3	1·7	11·3	3·7	17·3	5·6
54	4 58·5	4 59·3	4 44·9	5·4	1·8	11·4	3·7	17·4	5·7
55	4 58·8	4 59·6	4 45·1	5·5	1·8	11·5	3·7	17·5	5·7
56	4 59·0	4 59·8	4 45·4	5·6	1·8	11·6	3·8	17·6	5·7
57	4 59·3	5 00·1	4 45·6	5·7	1·9	11·7	3·8	17·7	5·8
58	4 59·5	5 00·3	4 45·9	5·8	1·9	11·8	3·8	17·8	5·8
59	4 59·8	5 00·6	4 46·1	5·9	1·9	11·9	3·9	17·9	5·8
60	5 00·0	5 00·8	4 46·3	6·0	2·0	12·0	3·9	18·0	5·9

20m	SOL PLANETAS	ARIES	LUNA	v o d	Corrn	v o d	Corrn	v o d	Corrn
s	° ′	° ′	° ′	′	′	′	′	′	′
00	5 00·0	5 00·8	4 46·3	0·0	0·0	6·0	2·1	12·0	4·1
01	5 00·3	5 01·1	4 46·6	0·1	0·0	6·1	2·1	12·1	4·1
02	5 00·5	5 01·3	4 46·8	0·2	0·1	6·2	2·1	12·2	4·2
03	5 00·8	5 01·6	4 47·0	0·3	0·1	6·3	2·2	12·3	4·2
04	5 01·0	5 01·8	4 47·3	0·4	0·1	6·4	2·2	12·4	4·2
05	5 01·3	5 02·1	4 47·5	0·5	0·2	6·5	2·2	12·5	4·3
06	5 01·5	5 02·3	4 47·8	0·6	0·2	6·6	2·3	12·6	4·3
07	5 01·8	5 02·6	4 48·0	0·7	0·2	6·7	2·3	12·7	4·3
08	5 02·0	5 02·8	4 48·2	0·8	0·3	6·8	2·3	12·8	4·4
09	5 02·3	5 03·1	4 48·5	0·9	0·3	6·9	2·4	12·9	4·4
10	5 02·5	5 03·3	4 48·7	1·0	0·3	7·0	2·4	13·0	4·4
11	5 02·8	5 03·6	4 49·0	1·1	0·4	7·1	2·4	13·1	4·5
12	5 03·0	5 03·8	4 49·2	1·2	0·4	7·2	2·5	13·2	4·5
13	5 03·3	5 04·1	4 49·4	1·3	0·4	7·3	2·5	13·3	4·5
14	5 03·5	5 04·3	4 49·7	1·4	0·5	7·4	2·5	13·4	4·6
15	5 03·8	5 04·6	4 49·9	1·5	0·5	7·5	2·6	13·5	4·6
16	5 04·0	5 04·8	4 50·2	1·6	0·5	7·6	2·6	13·6	4·6
17	5 04·3	5 05·1	4 50·4	1·7	0·6	7·7	2·6	13·7	4·7
18	5 04·5	5 05·3	4 50·6	1·8	0·6	7·8	2·7	13·8	4·7
19	5 04·8	5 05·6	4 50·9	1·9	0·6	7·9	2·7	13·9	4·7
20	5 05·0	5 05·8	4 51·1	2·0	0·7	8·0	2·7	14·0	4·8
21	5 05·3	5 06·1	4 51·3	2·1	0·7	8·1	2·8	14·1	4·8
22	5 05·5	5 06·3	4 51·6	2·2	0·8	8·2	2·8	14·2	4·9
23	5 05·8	5 06·6	4 51·8	2·3	0·8	8·3	2·8	14·3	4·9
24	5 06·0	5 06·8	4 52·1	2·4	0·8	8·4	2·9	14·4	4·9
25	5 06·3	5 07·1	4 52·3	2·5	0·9	8·5	2·9	14·5	5·0
26	5 06·5	5 07·3	4 52·5	2·6	0·9	8·6	2·9	14·6	5·0
27	5 06·8	5 07·6	4 52·8	2·7	0·9	8·7	3·0	14·7	5·0
28	5 07·0	5 07·8	4 53·0	2·8	1·0	8·8	3·0	14·8	5·1
29	5 07·3	5 08·1	4 53·3	2·9	1·0	8·9	3·0	14·9	5·1
30	5 07·5	5 08·3	4 53·5	3·0	1·0	9·0	3·1	15·0	5·1
31	5 07·8	5 08·6	4 53·7	3·1	1·1	9·1	3·1	15·1	5·2
32	5 08·0	5 08·8	4 54·0	3·2	1·1	9·2	3·1	15·2	5·2
33	5 08·3	5 09·1	4 54·2	3·3	1·1	9·3	3·2	15·3	5·2
34	5 08·5	5 09·3	4 54·4	3·4	1·2	9·4	3·2	15·4	5·3
35	5 08·8	5 09·6	4 54·7	3·5	1·2	9·5	3·2	15·5	5·3
36	5 09·0	5 09·8	4 54·9	3·6	1·2	9·6	3·3	15·6	5·3
37	5 09·3	5 10·1	4 55·2	3·7	1·3	9·7	3·3	15·7	5·4
38	5 09·5	5 10·3	4 55·4	3·8	1·3	9·8	3·3	15·8	5·4
39	5 09·8	5 10·6	4 55·6	3·9	1·3	9·9	3·4	15·9	5·4
40	5 10·0	5 10·8	4 55·9	4·0	1·4	10·0	3·4	16·0	5·5
41	5 10·3	5 11·1	4 56·1	4·1	1·4	10·1	3·5	16·1	5·5
42	5 10·5	5 11·4	4 56·4	4·2	1·4	10·2	3·5	16·2	5·5
43	5 10·8	5 11·6	4 56·6	4·3	1·5	10·3	3·5	16·3	5·6
44	5 11·0	5 11·9	4 56·8	4·4	1·5	10·4	3·6	16·4	5·6
45	5 11·3	5 12·1	4 57·1	4·5	1·5	10·5	3·6	16·5	5·6
46	5 11·5	5 12·4	4 57·3	4·6	1·6	10·6	3·6	16·6	5·7
47	5 11·8	5 12·6	4 57·5	4·7	1·6	10·7	3·7	16·7	5·7
48	5 12·0	5 12·9	4 57·8	4·8	1·6	10·8	3·7	16·8	5·7
49	5 12·3	5 13·1	4 58·0	4·9	1·7	10·9	3·7	16·9	5·8
50	5 12·5	5 13·4	4 58·3	5·0	1·7	11·0	3·8	17·0	5·8
51	5 12·8	5 13·6	4 58·5	5·1	1·7	11·1	3·8	17·1	5·8
52	5 13·0	5 13·9	4 58·7	5·2	1·8	11·2	3·8	17·2	5·9
53	5 13·3	5 14·1	4 59·0	5·3	1·8	11·3	3·9	17·3	5·9
54	5 13·5	5 14·4	4 59·2	5·4	1·8	11·4	3·9	17·4	5·9
55	5 13·8	5 14·6	4 59·5	5·5	1·9	11·5	3·9	17·5	6·0
56	5 14·0	5 14·9	4 59·7	5·6	1·9	11·6	4·0	17·6	6·0
57	5 14·3	5 15·1	4 59·9	5·7	1·9	11·7	4·0	17·7	6·0
58	5 14·5	5 15·4	5 00·2	5·8	2·0	11·8	4·0	17·8	6·1
59	5 14·8	5 15·6	5 00·4	5·9	2·0	11·9	4·1	17·9	6·1
60	5 15·0	5 15·9	5 00·7	6·0	2·1	12·0	4·1	18·0	6·2

21m	SOL PLANETAS	ARIES	LUNA	v o d	Corrn	v o d	Corrn	v o d	Corrn
s	° ′	° ′	° ′	′	′	′	′	′	′
00	5 15·0	5 15·9	5 00·7	0·0	0·0	6·0	2·2	12·0	4·3
01	5 15·3	5 16·1	5 00·9	0·1	0·0	6·1	2·2	12·1	4·3
02	5 15·5	5 16·4	5 01·1	0·2	0·1	6·2	2·2	12·2	4·4
03	5 15·8	5 16·6	5 01·4	0·3	0·1	6·3	2·3	12·3	4·4
04	5 16·0	5 16·9	5 01·6	0·4	0·1	6·4	2·3	12·4	4·4
05	5 16·3	5 17·1	5 01·8	0·5	0·2	6·5	2·3	12·5	4·5
06	5 16·5	5 17·4	5 02·1	0·6	0·2	6·6	2·4	12·6	4·5
07	5 16·8	5 17·6	5 02·3	0·7	0·3	6·7	2·4	12·7	4·6
08	5 17·0	5 17·9	5 02·6	0·8	0·3	6·8	2·4	12·8	4·6
09	5 17·3	5 18·1	5 02·8	0·9	0·3	6·9	2·5	12·9	4·6
10	5 17·5	5 18·4	5 03·0	1·0	0·4	7·0	2·5	13·0	4·7
11	5 17·8	5 18·6	5 03·3	1·1	0·4	7·1	2·5	13·1	4·7
12	5 18·0	5 18·9	5 03·5	1·2	0·4	7·2	2·6	13·2	4·7
13	5 18·3	5 19·1	5 03·8	1·3	0·5	7·3	2·6	13·3	4·8
14	5 18·5	5 19·4	5 04·0	1·4	0·5	7·4	2·7	13·4	4·8
15	5 18·8	5 19·6	5 04·2	1·5	0·5	7·5	2·7	13·5	4·8
16	5 19·0	5 19·9	5 04·5	1·6	0·6	7·6	2·7	13·6	4·9
17	5 19·3	5 20·1	5 04·7	1·7	0·6	7·7	2·8	13·7	4·9
18	5 19·5	5 20·4	5 04·9	1·8	0·6	7·8	2·8	13·8	4·9
19	5 19·8	5 20·6	5 05·2	1·9	0·7	7·9	2·8	13·9	5·0
20	5 20·0	5 20·9	5 05·4	2·0	0·7	8·0	2·9	14·0	5·0
21	5 20·3	5 21·1	5 05·7	2·1	0·8	8·1	2·9	14·1	5·1
22	5 20·5	5 21·4	5 05·9	2·2	0·8	8·2	2·9	14·2	5·1
23	5 20·8	5 21·6	5 06·1	2·3	0·8	8·3	3·0	14·3	5·1
24	5 21·0	5 21·9	5 06·4	2·4	0·9	8·4	3·0	14·4	5·2
25	5 21·3	5 22·1	5 06·6	2·5	0·9	8·5	3·0	14·5	5·2
26	5 21·5	5 22·4	5 06·9	2·6	0·9	8·6	3·1	14·6	5·2
27	5 21·8	5 22·6	5 07·1	2·7	1·0	8·7	3·1	14·7	5·3
28	5 22·0	5 22·9	5 07·3	2·8	1·0	8·8	3·2	14·8	5·3
29	5 22·3	5 23·1	5 07·6	2·9	1·0	8·9	3·2	14·9	5·3
30	5 22·5	5 23·4	5 07·8	3·0	1·1	9·0	3·2	15·0	5·4
31	5 22·8	5 23·6	5 08·0	3·1	1·1	9·1	3·3	15·1	5·4
32	5 23·0	5 23·9	5 08·3	3·2	1·1	9·2	3·3	15·2	5·4
33	5 23·3	5 24·1	5 08·5	3·3	1·2	9·3	3·3	15·3	5·5
34	5 23·5	5 24·4	5 08·8	3·4	1·2	9·4	3·4	15·4	5·5
35	5 23·8	5 24·6	5 09·0	3·5	1·3	9·5	3·4	15·5	5·6
36	5 24·0	5 24·9	5 09·2	3·6	1·3	9·6	3·4	15·6	5·6
37	5 24·3	5 25·1	5 09·5	3·7	1·3	9·7	3·5	15·7	5·6
38	5 24·5	5 25·4	5 09·7	3·8	1·4	9·8	3·5	15·8	5·7
39	5 24·8	5 25·6	5 10·0	3·9	1·4	9·9	3·5	15·9	5·7
40	5 25·0	5 25·9	5 10·2	4·0	1·4	10·0	3·6	16·0	5·7
41	5 25·3	5 26·1	5 10·4	4·1	1·5	10·1	3·6	16·1	5·8
42	5 25·5	5 26·4	5 10·7	4·2	1·5	10·2	3·7	16·2	5·8
43	5 25·8	5 26·6	5 10·9	4·3	1·5	10·3	3·7	16·3	5·8
44	5 26·0	5 26·9	5 11·1	4·4	1·6	10·4	3·7	16·4	5·9
45	5 26·3	5 27·1	5 11·4	4·5	1·6	10·5	3·8	16·5	5·9
46	5 26·5	5 27·4	5 11·6	4·6	1·6	10·6	3·8	16·6	5·9
47	5 26·8	5 27·6	5 11·9	4·7	1·7	10·7	3·8	16·7	6·0
48	5 27·0	5 27·9	5 12·1	4·8	1·7	10·8	3·9	16·8	6·0
49	5 27·3	5 28·1	5 12·3	4·9	1·8	10·9	3·9	16·9	6·1
50	5 27·5	5 28·4	5 12·6	5·0	1·8	11·0	3·9	17·0	6·1
51	5 27·8	5 28·6	5 12·8	5·1	1·8	11·1	4·0	17·1	6·1
52	5 28·0	5 28·9	5 13·1	5·2	1·9	11·2	4·0	17·2	6·2
53	5 28·3	5 29·1	5 13·3	5·3	1·9	11·3	4·0	17·3	6·2
54	5 28·5	5 29·4	5 13·5	5·4	1·9	11·4	4·1	17·4	6·2
55	5 28·8	5 29·7	5 13·8	5·5	2·0	11·5	4·1	17·5	6·3
56	5 29·0	5 29·9	5 14·0	5·6	2·0	11·6	4·2	17·6	6·3
57	5 29·3	5 30·2	5 14·3	5·7	2·0	11·7	4·2	17·7	6·3
58	5 29·5	5 30·4	5 14·5	5·8	2·1	11·8	4·2	17·8	6·4
59	5 29·8	5 30·7	5 14·7	5·9	2·1	11·9	4·3	17·9	6·4
60	5 30·0	5 30·9	5 15·0	6·0	2·2	12·0	4·3	18·0	6·5

22m s	SOL PLANETAS ° ′	ARIES ° ′	LUNA ° ′	v o d Corrn ′ ′	v o d Corrn ′ ′	v o d Corrn ′ ′
00	5 30·0	5 30·9	5 15·0	0·0 0·0	6·0 2·3	12·0 4·5
01	5 30·3	5 31·2	5 15·2	0·1 0·0	6·1 2·3	12·1 4·5
02	5 30·5	5 31·4	5 15·4	0·2 0·1	6·2 2·3	12·2 4·6
03	5 30·8	5 31·7	5 15·7	0·3 0·1	6·3 2·4	12·3 4·6
04	5 31·0	5 31·9	5 15·9	0·4 0·2	6·4 2·4	12·4 4·7
05	5 31·3	5 32·2	5 16·2	0·5 0·2	6·5 2·4	12·5 4·7
06	5 31·5	5 32·4	5 16·4	0·6 0·2	6·6 2·5	12·6 4·7
07	5 31·8	5 32·7	5 16·6	0·7 0·3	6·7 2·5	12·7 4·8
08	5 32·0	5 32·9	5 16·9	0·8 0·3	6·8 2·6	12·8 4·8
09	5 32·3	5 33·2	5 17·1	0·9 0·3	6·9 2·6	12·9 4·8
10	5 32·5	5 33·4	5 17·4	1·0 0·4	7·0 2·6	13·0 4·9
11	5 32·8	5 33·7	5 17·6	1·1 0·4	7·1 2·7	13·1 4·9
12	5 33·0	5 33·9	5 17·8	1·2 0·5	7·2 2·7	13·2 5·0
13	5 33·3	5 34·2	5 18·1	1·3 0·5	7·3 2·7	13·3 5·0
14	5 33·5	5 34·4	5 18·3	1·4 0·5	7·4 2·8	13·4 5·0
15	5 33·8	5 34·7	5 18·5	1·5 0·6	7·5 2·8	13·5 5·1
16	5 34·0	5 34·9	5 18·8	1·6 0·6	7·6 2·9	13·6 5·1
17	5 34·3	5 35·2	5 19·0	1·7 0·6	7·7 2·9	13·7 5·1
18	5 34·5	5 35·4	5 19·3	1·8 0·7	7·8 2·9	13·8 5·2
19	5 34·8	5 35·7	5 19·5	1·9 0·7	7·9 3·0	13·9 5·2
20	5 35·0	5 35·9	5 19·7	2·0 0·8	8·0 3·0	14·0 5·3
21	5 35·3	5 36·2	5 20·0	2·1 0·8	8·1 3·0	14·1 5·3
22	5 35·5	5 36·4	5 20·2	2·2 0·8	8·2 3·1	14·2 5·3
23	5 35·8	5 36·7	5 20·5	2·3 0·9	8·3 3·1	14·3 5·4
24	5 36·0	5 36·9	5 20·7	2·4 0·9	8·4 3·2	14·4 5·4
25	5 36·3	5 37·2	5 20·9	2·5 0·9	8·5 3·2	14·5 5·4
26	5 36·5	5 37·4	5 21·2	2·6 1·0	8·6 3·2	14·6 5·5
27	5 36·8	5 37·7	5 21·4	2·7 1·0	8·7 3·3	14·7 5·5
28	5 37·0	5 37·9	5 21·6	2·8 1·1	8·8 3·3	14·8 5·6
29	5 37·3	5 38·2	5 21·9	2·9 1·1	8·9 3·3	14·9 5·6
30	5 37·5	5 38·4	5 22·1	3·0 1·1	9·0 3·4	15·0 5·6
31	5 37·8	5 38·7	5 22·4	3·1 1·2	9·1 3·4	15·1 5·7
32	5 38·0	5 38·9	5 22·6	3·2 1·2	9·2 3·5	15·2 5·7
33	5 38·3	5 39·2	5 22·8	3·3 1·2	9·3 3·5	15·3 5·7
34	5 38·5	5 39·4	5 23·1	3·4 1·3	9·4 3·5	15·4 5·8
35	5 38·8	5 39·7	5 23·3	3·5 1·3	9·5 3·6	15·5 5·8
36	5 39·0	5 39·9	5 23·6	3·6 1·4	9·6 3·6	15·6 5·9
37	5 39·3	5 40·2	5 23·8	3·7 1·4	9·7 3·6	15·7 5·9
38	5 39·5	5 40·4	5 24·0	3·8 1·4	9·8 3·7	15·8 5·9
39	5 39·8	5 40·7	5 24·3	3·9 1·5	9·9 3·7	15·9 6·0
40	5 40·0	5 40·9	5 24·5	4·0 1·5	10·0 3·8	16·0 6·0
41	5 40·3	5 41·2	5 24·7	4·1 1·5	10·1 3·8	16·1 6·0
42	5 40·5	5 41·4	5 25·0	4·2 1·6	10·2 3·8	16·2 6·1
43	5 40·8	5 41·7	5 25·2	4·3 1·6	10·3 3·9	16·3 6·1
44	5 41·0	5 41·9	5 25·5	4·4 1·7	10·4 3·9	16·4 6·2
45	5 41·3	5 42·2	5 25·7	4·5 1·7	10·5 3·9	16·5 6·2
46	5 41·5	5 42·4	5 25·9	4·6 1·7	10·6 4·0	16·6 6·2
47	5 41·8	5 42·7	5 26·2	4·7 1·8	10·7 4·0	16·7 6·3
48	5 42·0	5 42·9	5 26·4	4·8 1·8	10·8 4·1	16·8 6·3
49	5 42·3	5 43·2	5 26·7	4·9 1·8	10·9 4·1	16·9 6·3
50	5 42·5	5 43·4	5 26·9	5·0 1·9	11·0 4·1	17·0 6·4
51	5 42·8	5 43·7	5 27·1	5·1 1·9	11·1 4·2	17·1 6·4
52	5 43·0	5 43·9	5 27·4	5·2 2·0	11·2 4·2	17·2 6·5
53	5 43·3	5 44·2	5 27·6	5·3 2·0	11·3 4·2	17·3 6·5
54	5 43·5	5 44·4	5 27·9	5·4 2·0	11·4 4·3	17·4 6·5
55	5 43·8	5 44·7	5 28·1	5·5 2·1	11·5 4·3	17·5 6·6
56	5 44·0	5 44·9	5 28·3	5·6 2·1	11·6 4·4	17·6 6·6
57	5 44·3	5 45·2	5 28·6	5·7 2·1	11·7 4·4	17·7 6·6
58	5 44·5	5 45·4	5 28·8	5·8 2·2	11·8 4·4	17·8 6·7
59	5 44·8	5 45·7	5 29·0	5·9 2·2	11·9 4·5	17·9 6·7
60	5 45·0	5 45·9	5 29·3	6·0 2·3	12·0 4·5	18·0 6·8

23m s	SOL PLANETAS ° ′	ARIES ° ′	LUNA ° ′	v o d Corrn ′ ′	v o d Corrn ′ ′	v o d Corrn ′ ′
00	5 45·0	5 45·9	5 29·3	0·0 0·0	6·0 2·4	12·0 4·7
01	5 45·3	5 46·2	5 29·5	0·1 0·0	6·1 2·4	12·1 4·7
02	5 45·5	5 46·4	5 29·8	0·2 0·1	6·2 2·4	12·2 4·8
03	5 45·8	5 46·7	5 30·0	0·3 0·1	6·3 2·5	12·3 4·8
04	5 46·0	5 46·9	5 30·2	0·4 0·2	6·4 2·5	12·4 4·9
05	5 46·3	5 47·2	5 30·5	0·5 0·2	6·5 2·5	12·5 4·9
06	5 46·5	5 47·4	5 30·7	0·6 0·2	6·6 2·6	12·6 4·9
07	5 46·8	5 47·7	5 31·0	0·7 0·3	6·7 2·6	12·7 5·0
08	5 47·0	5 48·0	5 31·2	0·8 0·3	6·8 2·7	12·8 5·0
09	5 47·3	5 48·2	5 31·4	0·9 0·4	6·9 2·7	12·9 5·1
10	5 47·5	5 48·5	5 31·7	1·0 0·4	7·0 2·7	13·0 5·1
11	5 47·8	5 48·7	5 31·9	1·1 0·4	7·1 2·8	13·1 5·1
12	5 48·0	5 49·0	5 32·1	1·2 0·5	7·2 2·8	13·2 5·2
13	5 48·3	5 49·2	5 32·4	1·3 0·5	7·3 2·9	13·3 5·2
14	5 48·5	5 49·5	5 32·6	1·4 0·5	7·4 2·9	13·4 5·2
15	5 48·8	5 49·7	5 32·9	1·5 0·6	7·5 2·9	13·5 5·3
16	5 49·0	5 50·0	5 33·1	1·6 0·6	7·6 3·0	13·6 5·3
17	5 49·3	5 50·2	5 33·3	1·7 0·7	7·7 3·0	13·7 5·4
18	5 49·5	5 50·5	5 33·6	1·8 0·7	7·8 3·1	13·8 5·4
19	5 49·8	5 50·7	5 33·8	1·9 0·7	7·9 3·1	13·9 5·4
20	5 50·0	5 51·0	5 34·1	2·0 0·8	8·0 3·1	14·0 5·5
21	5 50·3	5 51·2	5 34·3	2·1 0·8	8·1 3·2	14·1 5·5
22	5 50·5	5 51·5	5 34·5	2·2 0·9	8·2 3·2	14·2 5·6
23	5 50·8	5 51·7	5 34·8	2·3 0·9	8·3 3·3	14·3 5·6
24	5 51·0	5 52·0	5 35·0	2·4 0·9	8·4 3·3	14·4 5·6
25	5 51·3	5 52·2	5 35·2	2·5 1·0	8·5 3·3	14·5 5·7
26	5 51·5	5 52·5	5 35·5	2·6 1·0	8·6 3·4	14·6 5·7
27	5 51·8	5 52·7	5 35·7	2·7 1·1	8·7 3·4	14·7 5·8
28	5 52·0	5 53·0	5 36·0	2·8 1·1	8·8 3·4	14·8 5·8
29	5 52·3	5 53·2	5 36·2	2·9 1·1	8·9 3·5	14·9 5·8
30	5 52·5	5 53·5	5 36·4	3·0 1·2	9·0 3·5	15·0 5·9
31	5 52·8	5 53·7	5 36·7	3·1 1·2	9·1 3·6	15·1 5·9
32	5 53·0	5 54·0	5 36·9	3·2 1·3	9·2 3·6	15·2 6·0
33	5 53·3	5 54·2	5 37·2	3·3 1·3	9·3 3·6	15·3 6·0
34	5 53·5	5 54·5	5 37·4	3·4 1·3	9·4 3·7	15·4 6·0
35	5 53·8	5 54·7	5 37·6	3·5 1·4	9·5 3·7	15·5 6·1
36	5 54·0	5 55·0	5 37·9	3·6 1·4	9·6 3·8	15·6 6·1
37	5 54·3	5 55·2	5 38·1	3·7 1·4	9·7 3·8	15·7 6·1
38	5 54·5	5 55·5	5 38·4	3·8 1·5	9·8 3·8	15·8 6·2
39	5 54·8	5 55·7	5 38·6	3·9 1·5	9·9 3·9	15·9 6·2
40	5 55·0	5 56·0	5 38·8	4·0 1·6	10·0 3·9	16·0 6·3
41	5 55·3	5 56·2	5 39·1	4·1 1·6	10·1 4·0	16·1 6·3
42	5 55·5	5 56·5	5 39·3	4·2 1·6	10·2 4·0	16·2 6·3
43	5 55·8	5 56·7	5 39·5	4·3 1·7	10·3 4·0	16·3 6·4
44	5 56·0	5 57·0	5 39·8	4·4 1·7	10·4 4·1	16·4 6·4
45	5 56·3	5 57·2	5 40·0	4·5 1·8	10·5 4·1	16·5 6·5
46	5 56·5	5 57·5	5 40·3	4·6 1·8	10·6 4·2	16·6 6·5
47	5 56·8	5 57·7	5 40·5	4·7 1·8	10·7 4·2	16·7 6·5
48	5 57·0	5 58·0	5 40·7	4·8 1·9	10·8 4·2	16·8 6·6
49	5 57·3	5 58·2	5 41·0	4·9 1·9	10·9 4·3	16·9 6·6
50	5 57·5	5 58·5	5 41·2	5·0 2·0	11·0 4·3	17·0 6·7
51	5 57·8	5 58·7	5 41·5	5·1 2·0	11·1 4·3	17·1 6·7
52	5 58·0	5 59·0	5 41·7	5·2 2·0	11·2 4·4	17·2 6·7
53	5 58·3	5 59·2	5 41·9	5·3 2·1	11·3 4·4	17·3 6·8
54	5 58·5	5 59·5	5 42·2	5·4 2·1	11·4 4·5	17·4 6·8
55	5 58·8	5 59·7	5 42·4	5·5 2·2	11·5 4·5	17·5 6·9
56	5 59·0	6 00·0	5 42·6	5·6 2·2	11·6 4·5	17·6 6·9
57	5 59·3	6 00·2	5 42·9	5·7 2·2	11·7 4·6	17·7 6·9
58	5 59·5	6 00·5	5 43·1	5·8 2·3	11·8 4·6	17·8 7·0
59	5 59·8	6 00·7	5 43·4	5·9 2·3	11·9 4·7	17·9 7·0
60	6 00·0	6 01·0	5 43·6	6·0 2·4	12·0 4·7	18·0 7·1

24m	SOL PLANETAS	ARIES	LUNA	v o d	Corrn	v o d	Corrn	v o d	Corrn
s	° ′	° ′	° ′	′	′	′	′	′	′
00	6 00·0	6 01·0	5 43·6	0·0	0·0	6·0	2·5	12·0	4·9
01	6 00·3	6 01·2	5 43·8	0·1	0·0	6·1	2·5	12·1	4·9
02	6 00·5	6 01·5	5 44·1	0·2	0·1	6·2	2·5	12·2	5·0
03	6 00·8	6 01·7	5 44·3	0·3	0·1	6·3	2·6	12·3	5·0
04	6 01·0	6 02·0	5 44·6	0·4	0·2	6·4	2·6	12·4	5·1
05	6 01·3	6 02·2	5 44·8	0·5	0·2	6·5	2·7	12·5	5·1
06	6 01·5	6 02·5	5 45·0	0·6	0·2	6·6	2·7	12·6	5·1
07	6 01·8	6 02·7	5 45·3	0·7	0·3	6·7	2·7	12·7	5·2
08	6 02·0	6 03·0	5 45·5	0·8	0·3	6·8	2·8	12·8	5·2
09	6 02·3	6 03·2	5 45·7	0·9	0·4	6·9	2·8	12·9	5·3
10	6 02·5	6 03·5	5 46·0	1·0	0·4	7·0	2·9	13·0	5·3
11	6 02·8	6 03·7	5 46·2	1·1	0·4	7·1	2·9	13·1	5·3
12	6 03·0	6 04·0	5 46·5	1·2	0·5	7·2	2·9	13·2	5·4
13	6 03·3	6 04·2	5 46·7	1·3	0·5	7·3	3·0	13·3	5·4
14	6 03·5	6 04·5	5 46·9	1·4	0·6	7·4	3·0	13·4	5·5
15	6 03·8	6 04·7	5 47·2	1·5	0·6	7·5	3·1	13·5	5·5
16	6 04·0	6 05·0	5 47·4	1·6	0·7	7·6	3·1	13·6	5·6
17	6 04·3	6 05·2	5 47·7	1·7	0·7	7·7	3·1	13·7	5·6
18	6 04·5	6 05·5	5 47·9	1·8	0·7	7·8	3·2	13·8	5·6
19	6 04·8	6 05·7	5 48·1	1·9	0·8	7·9	3·2	13·9	5·7
20	6 05·0	6 06·0	5 48·4	2·0	0·8	8·0	3·3	14·0	5·7
21	6 05·3	6 06·3	5 48·6	2·1	0·9	8·1	3·3	14·1	5·8
22	6 05·5	6 06·5	5 48·8	2·2	0·9	8·2	3·3	14·2	5·8
23	6 05·8	6 06·8	5 49·1	2·3	0·9	8·3	3·4	14·3	5·8
24	6 06·0	6 07·0	5 49·3	2·4	1·0	8·4	3·4	14·4	5·9
25	6 06·3	6 07·3	5 49·6	2·5	1·0	8·5	3·5	14·5	5·9
26	6 06·5	6 07·5	5 49·8	2·6	1·1	8·6	3·5	14·6	6·0
27	6 06·8	6 07·8	5 50·0	2·7	1·1	8·7	3·6	14·7	6·0
28	6 07·0	6 08·0	5 50·3	2·8	1·1	8·8	3·6	14·8	6·0
29	6 07·3	6 08·3	5 50·5	2·9	1·2	8·9	3·6	14·9	6·1
30	6 07·5	6 08·5	5 50·8	3·0	1·2	9·0	3·7	15·0	6·1
31	6 07·8	6 08·8	5 51·0	3·1	1·3	9·1	3·7	15·1	6·2
32	6 08·0	6 09·0	5 51·2	3·2	1·3	9·2	3·8	15·2	6·2
33	6 08·3	6 09·3	5 51·5	3·3	1·3	9·3	3·8	15·3	6·2
34	6 08·5	6 09·5	5 51·7	3·4	1·4	9·4	3·8	15·4	6·3
35	6 08·8	6 09·8	5 52·0	3·5	1·4	9·5	3·9	15·5	6·3
36	6 09·0	6 10·0	5 52·2	3·6	1·5	9·6	3·9	15·6	6·4
37	6 09·3	6 10·3	5 52·4	3·7	1·5	9·7	4·0	15·7	6·4
38	6 09·5	6 10·5	5 52·7	3·8	1·6	9·8	4·0	15·8	6·5
39	6 09·8	6 10·8	5 52·9	3·9	1·6	9·9	4·0	15·9	6·5
40	6 10·0	6 11·0	5 53·1	4·0	1·6	10·0	4·1	16·0	6·5
41	6 10·3	6 11·3	5 53·4	4·1	1·7	10·1	4·1	16·1	6·6
42	6 10·5	6 11·5	5 53·6	4·2	1·7	10·2	4·2	16·2	6·6
43	6 10·8	6 11·8	5 53·9	4·3	1·8	10·3	4·2	16·3	6·7
44	6 11·0	6 12·0	5 54·1	4·4	1·8	10·4	4·2	16·4	6·7
45	6 11·3	6 12·3	5 54·3	4·5	1·8	10·5	4·3	16·5	6·7
46	6 11·5	6 12·5	5 54·6	4·6	1·9	10·6	4·3	16·6	6·8
47	6 11·8	6 12·8	5 54·8	4·7	1·9	10·7	4·4	16·7	6·8
48	6 12·0	6 13·0	5 55·1	4·8	2·0	10·8	4·4	16·8	6·9
49	6 12·3	6 13·3	5 55·3	4·9	2·0	10·9	4·5	16·9	6·9
50	6 12·5	6 13·5	5 55·5	5·0	2·0	11·0	4·5	17·0	6·9
51	6 12·8	6 13·8	5 55·8	5·1	2·1	11·1	4·5	17·1	7·0
52	6 13·0	6 14·0	5 56·0	5·2	2·1	11·2	4·6	17·2	7·0
53	6 13·3	6 14·3	5 56·2	5·3	2·2	11·3	4·6	17·3	7·1
54	6 13·5	6 14·5	5 56·5	5·4	2·2	11·4	4·7	17·4	7·1
55	6 13·8	6 14·8	5 56·7	5·5	2·2	11·5	4·7	17·5	7·1
56	6 14·0	6 15·0	5 57·0	5·6	2·3	11·6	4·7	17·6	7·2
57	6 14·3	6 15·3	5 57·2	5·7	2·3	11·7	4·8	17·7	7·2
58	6 14·5	6 15·5	5 57·4	5·8	2·4	11·8	4·8	17·8	7·3
59	6 14·8	6 15·8	5 57·7	5·9	2·4	11·9	4·9	17·9	7·3
60	6 15·0	6 16·0	5 57·9	6·0	2·5	12·0	4·9	18·0	7·4

25m	SOL PLANETAS	ARIES	LUNA	v o d	Corrn	v o d	Corrn	v o d	Corrn
s	° ′	° ′	° ′	′	′	′	′	′	′
00	6 15·0	6 16·0	5 57·9	0·0	0·0	6·0	2·6	12·0	5·1
01	6 15·3	6 16·3	5 58·2	0·1	0·0	6·1	2·6	12·1	5·1
02	6 15·5	6 16·5	5 58·4	0·2	0·1	6·2	2·6	12·2	5·2
03	6 15·8	6 16·8	5 58·6	0·3	0·1	6·3	2·7	12·3	5·2
04	6 16·0	6 17·0	5 58·9	0·4	0·2	6·4	2·7	12·4	5·3
05	6 16·3	6 17·3	5 59·1	0·5	0·2	6·5	2·8	12·5	5·3
06	6 16·5	6 17·5	5 59·3	0·6	0·3	6·6	2·8	12·6	5·4
07	6 16·8	6 17·8	5 59·6	0·7	0·3	6·7	2·8	12·7	5·4
08	6 17·0	6 18·0	5 59·8	0·8	0·3	6·8	2·9	12·8	5·4
09	6 17·3	6 18·3	6 00·1	0·9	0·4	6·9	2·9	12·9	5·5
10	6 17·5	6 18·5	6 00·3	1·0	0·4	7·0	3·0	13·0	5·5
11	6 17·8	6 18·8	6 00·5	1·1	0·5	7·1	3·0	13·1	5·6
12	6 18·0	6 19·0	6 00·8	1·2	0·5	7·2	3·1	13·2	5·6
13	6 18·3	6 19·3	6 01·0	1·3	0·6	7·3	3·1	13·3	5·7
14	6 18·5	6 19·5	6 01·3	1·4	0·6	7·4	3·1	13·4	5·7
15	6 18·8	6 19·8	6 01·5	1·5	0·6	7·5	3·2	13·5	5·7
16	6 19·0	6 20·0	6 01·7	1·6	0·7	7·6	3·2	13·6	5·8
17	6 19·3	6 20·3	6 02·0	1·7	0·7	7·7	3·3	13·7	5·8
18	6 19·5	6 20·5	6 02·2	1·8	0·8	7·8	3·3	13·8	5·9
19	6 19·8	6 20·8	6 02·5	1·9	0·8	7·9	3·4	13·9	5·9
20	6 20·0	6 21·0	6 02·7	2·0	0·9	8·0	3·4	14·0	6·0
21	6 20·3	6 21·3	6 02·9	2·1	0·9	8·1	3·4	14·1	6·0
22	6 20·5	6 21·5	6 03·2	2·2	0·9	8·2	3·5	14·2	6·0
23	6 20·8	6 21·8	6 03·4	2·3	1·0	8·3	3·5	14·3	6·1
24	6 21·0	6 22·0	6 03·6	2·4	1·0	8·4	3·6	14·4	6·1
25	6 21·3	6 22·3	6 03·9	2·5	1·1	8·5	3·6	14·5	6·2
26	6 21·5	6 22·5	6 04·1	2·6	1·1	8·6	3·7	14·6	6·2
27	6 21·8	6 22·8	6 04·4	2·7	1·1	8·7	3·7	14·7	6·2
28	6 22·0	6 23·0	6 04·6	2·8	1·2	8·8	3·7	14·8	6·3
29	6 22·3	6 23·3	6 04·8	2·9	1·2	8·9	3·8	14·9	6·3
30	6 22·5	6 23·5	6 05·1	3·0	1·3	9·0	3·8	15·0	6·4
31	6 22·8	6 23·8	6 05·3	3·1	1·3	9·1	3·9	15·1	6·4
32	6 23·0	6 24·0	6 05·6	3·2	1·4	9·2	3·9	15·2	6·5
33	6 23·3	6 24·3	6 05·8	3·3	1·4	9·3	4·0	15·3	6·5
34	6 23·5	6 24·5	6 06·0	3·4	1·4	9·4	4·0	15·4	6·5
35	6 23·8	6 24·8	6 06·3	3·5	1·5	9·5	4·0	15·5	6·6
36	6 24·0	6 25·1	6 06·5	3·6	1·5	9·6	4·1	15·6	6·6
37	6 24·3	6 25·3	6 06·7	3·7	1·6	9·7	4·1	15·7	6·7
38	6 24·5	6 25·6	6 07·0	3·8	1·6	9·8	4·2	15·8	6·7
39	6 24·8	6 25·8	6 07·2	3·9	1·7	9·9	4·2	15·9	6·8
40	6 25·0	6 26·1	6 07·5	4·0	1·7	10·0	4·3	16·0	6·8
41	6 25·3	6 26·3	6 07·7	4·1	1·7	10·1	4·3	16·1	6·8
42	6 25·5	6 26·6	6 07·9	4·2	1·8	10·2	4·3	16·2	6·9
43	6 25·8	6 26·8	6 08·2	4·3	1·8	10·3	4·4	16·3	6·9
44	6 26·0	6 27·1	6 08·4	4·4	1·9	10·4	4·4	16·4	7·0
45	6 26·3	6 27·3	6 08·7	4·5	1·9	10·5	4·5	16·5	7·0
46	6 26·5	6 27·6	6 08·9	4·6	2·0	10·6	4·5	16·6	7·1
47	6 26·8	6 27·8	6 09·1	4·7	2·0	10·7	4·5	16·7	7·1
48	6 27·0	6 28·1	6 09·4	4·8	2·0	10·8	4·6	16·8	7·1
49	6 27·3	6 28·3	6 09·6	4·9	2·1	10·9	4·6	16·9	7·2
50	6 27·5	6 28·6	6 09·8	5·0	2·1	11·0	4·7	17·0	7·2
51	6 27·8	6 28·8	6 10·1	5·1	2·2	11·1	4·7	17·1	7·3
52	6 28·0	6 29·1	6 10·3	5·2	2·2	11·2	4·8	17·2	7·3
53	6 28·3	6 29·3	6 10·6	5·3	2·3	11·3	4·8	17·3	7·4
54	6 28·5	6 29·6	6 10·8	5·4	2·3	11·4	4·8	17·4	7·4
55	6 28·8	6 29·8	6 11·0	5·5	2·3	11·5	4·9	17·5	7·4
56	6 29·0	6 30·1	6 11·3	5·6	2·4	11·6	4·9	17·6	7·5
57	6 29·3	6 30·3	6 11·5	5·7	2·4	11·7	5·0	17·7	7·5
58	6 29·5	6 30·6	6 11·8	5·8	2·5	11·8	5·0	17·8	7·6
59	6 29·8	6 30·8	6 12·0	5·9	2·5	11·9	5·1	17·9	7·6
60	6 30·0	6 31·1	6 12·2	6·0	2·6	12·0	5·1	18·0	7·7

26m	SOL PLANETAS	ARIES	LUNA	v o d	Corrn	v o d	Corrn	v o d	Corrn
s	° ′	° ′	° ′	′	′	′	′	′	′
00	6 30·0	6 31·1	6 12·2	0·0	0·0	6·0	2·7	12·0	5·3
01	6 30·3	6 31·3	6 12·5	0·1	0·0	6·1	2·7	12·1	5·3
02	6 30·5	6 31·6	6 12·7	0·2	0·1	6·2	2·7	12·2	5·4
03	6 30·8	6 31·8	6 12·9	0·3	0·1	6·3	2·8	12·3	5·4
04	6 31·0	6 32·1	6 13·2	0·4	0·2	6·4	2·8	12·4	5·5
05	6 31·3	6 32·3	6 13·4	0·5	0·2	6·5	2·9	12·5	5·5
06	6 31·5	6 32·6	6 13·7	0·6	0·3	6·6	2·9	12·6	5·6
07	6 31·8	6 32·8	6 13·9	0·7	0·3	6·7	3·0	12·7	5·6
08	6 32·0	6 33·1	6 14·1	0·8	0·4	6·8	3·0	12·8	5·7
09	6 32·3	6 33·3	6 14·4	0·9	0·4	6·9	3·0	12·9	5·7
10	6 32·5	6 33·6	6 14·6	1·0	0·4	7·0	3·1	13·0	5·7
11	6 32·8	6 33·8	6 14·9	1·1	0·5	7·1	3·1	13·1	5·8
12	6 33·0	6 34·1	6 15·1	1·2	0·5	7·2	3·2	13·2	5·8
13	6 33·3	6 34·3	6 15·3	1·3	0·6	7·3	3·2	13·3	5·9
14	6 33·5	6 34·6	6 15·6	1·4	0·6	7·4	3·3	13·4	5·9
15	6 33·8	6 34·8	6 15·8	1·5	0·7	7·5	3·3	13·5	6·0
16	6 34·0	6 35·1	6 16·1	1·6	0·7	7·6	3·4	13·6	6·0
17	6 34·3	6 35·3	6 16·3	1·7	0·8	7·7	3·4	13·7	6·1
18	6 34·5	6 35·6	6 16·5	1·8	0·8	7·8	3·4	13·8	6·1
19	6 34·8	6 35·8	6 16·8	1·9	0·8	7·9	3·5	13·9	6·1
20	6 35·0	6 36·1	6 17·0	2·0	0·9	8·0	3·5	14·0	6·2
21	6 35·3	6 36·3	6 17·2	2·1	0·9	8·1	3·6	14·1	6·2
22	6 35·5	6 36·6	6 17·5	2·2	1·0	8·2	3·6	14·2	6·3
23	6 35·8	6 36·8	6 17·7	2·3	1·0	8·3	3·7	14·3	6·3
24	6 36·0	6 37·1	6 18·0	2·4	1·1	8·4	3·7	14·4	6·4
25	6 36·3	6 37·3	6 18·2	2·5	1·1	8·5	3·8	14·5	6·4
26	6 36·5	6 37·6	6 18·4	2·6	1·1	8·6	3·8	14·6	6·4
27	6 36·8	6 37·8	6 18·7	2·7	1·2	8·7	3·8	14·7	6·5
28	6 37·0	6 38·1	6 18·9	2·8	1·2	8·8	3·9	14·8	6·5
29	6 37·3	6 38·3	6 19·2	2·9	1·3	8·9	3·9	14·9	6·6
30	6 37·5	6 38·6	6 19·4	3·0	1·3	9·0	4·0	15·0	6·6
31	6 37·8	6 38·8	6 19·6	3·1	1·4	9·1	4·0	15·1	6·7
32	6 38·0	6 39·1	6 19·9	3·2	1·4	9·2	4·1	15·2	6·7
33	6 38·3	6 39·3	6 20·1	3·3	1·5	9·3	4·1	15·3	6·8
34	6 38·5	6 39·6	6 20·3	3·4	1·5	9·4	4·2	15·4	6·8
35	6 38·8	6 39·8	6 20·6	3·5	1·5	9·5	4·2	15·5	6·8
36	6 39·0	6 40·1	6 20·8	3·6	1·6	9·6	4·2	15·6	6·9
37	6 39·3	6 40·3	6 21·1	3·7	1·6	9·7	4·3	15·7	6·9
38	6 39·5	6 40·6	6 21·3	3·8	1·7	9·8	4·3	15·8	7·0
39	6 39·8	6 40·8	6 21·5	3·9	1·7	9·9	4·4	15·9	7·0
40	6 40·0	6 41·1	6 21·8	4·0	1·8	10·0	4·4	16·0	7·1
41	6 40·3	6 41·3	6 22·0	4·1	1·8	10·1	4·5	16·1	7·1
42	6 40·5	6 41·6	6 22·3	4·2	1·9	10·2	4·5	16·2	7·2
43	6 40·8	6 41·8	6 22·5	4·3	1·9	10·3	4·5	16·3	7·2
44	6 41·0	6 42·1	6 22·7	4·4	1·9	10·4	4·6	16·4	7·2
45	6 41·3	6 42·3	6 23·0	4·5	2·0	10·5	4·6	16·5	7·3
46	6 41·5	6 42·6	6 23·2	4·6	2·0	10·6	4·7	16·6	7·3
47	6 41·8	6 42·8	6 23·4	4·7	2·1	10·7	4·7	16·7	7·4
48	6 42·0	6 43·1	6 23·7	4·8	2·1	10·8	4·8	16·8	7·4
49	6 42·3	6 43·4	6 23·9	4·9	2·2	10·9	4·8	16·9	7·5
50	6 42·5	6 43·6	6 24·2	5·0	2·2	11·0	4·9	17·0	7·5
51	6 42·8	6 43·9	6 24·4	5·1	2·3	11·1	4·9	17·1	7·6
52	6 43·0	6 44·1	6 24·6	5·2	2·3	11·2	4·9	17·2	7·6
53	6 43·3	6 44·4	6 24·9	5·3	2·3	11·3	5·0	17·3	7·6
54	6 43·5	6 44·6	6 25·1	5·4	2·4	11·4	5·0	17·4	7·7
55	6 43·8	6 44·9	6 25·4	5·5	2·4	11·5	5·1	17·5	7·7
56	6 44·0	6 45·1	6 25·6	5·6	2·5	11·6	5·1	17·6	7·8
57	6 44·3	6 45·4	6 25·8	5·7	2·5	11·7	5·2	17·7	7·8
58	6 44·5	6 45·6	6 26·1	5·8	2·6	11·8	5·2	17·8	7·9
59	6 44·8	6 45·9	6 26·3	5·9	2·6	11·9	5·3	17·9	7·9
60	6 45·0	6 46·1	6 26·6	6·0	2·7	12·0	5·3	18·0	8·0

27m	SOL PLANETAS	ARIES	LUNA	v o d	Corrn	v o d	Corrn	v o d	Corrn
s	° ′	° ′	° ′	′	′	′	′	′	′
00	6 45·0	6 46·1	6 26·6	0·0	0·0	6·0	2·8	12·0	5·5
01	6 45·3	6 46·4	6 26·8	0·1	0·0	6·1	2·8	12·1	5·5
02	6 45·5	6 46·6	6 27·0	0·2	0·1	6·2	2·8	12·2	5·6
03	6 45·8	6 46·9	6 27·3	0·3	0·1	6·3	2·9	12·3	5·6
04	6 46·0	6 47·1	6 27·5	0·4	0·2	6·4	2·9	12·4	5·7
05	6 46·3	6 47·4	6 27·7	0·5	0·2	6·5	3·0	12·5	5·7
06	6 46·5	6 47·6	6 28·0	0·6	0·3	6·6	3·0	12·6	5·8
07	6 46·8	6 47·9	6 28·2	0·7	0·3	6·7	3·1	12·7	5·8
08	6 47·0	6 48·1	6 28·5	0·8	0·4	6·8	3·1	12·8	5·9
09	6 47·3	6 48·4	6 28·7	0·9	0·4	6·9	3·2	12·9	5·9
10	6 47·5	6 48·6	6 28·9	1·0	0·5	7·0	3·2	13·0	6·0
11	6 47·8	6 48·9	6 29·2	1·1	0·5	7·1	3·3	13·1	6·0
12	6 48·0	6 49·1	6 29·4	1·2	0·6	7·2	3·3	13·2	6·1
13	6 48·3	6 49·4	6 29·7	1·3	0·6	7·3	3·3	13·3	6·1
14	6 48·5	6 49·6	6 29·9	1·4	0·6	7·4	3·4	13·4	6·1
15	6 48·8	6 49·9	6 30·1	1·5	0·7	7·5	3·4	13·5	6·2
16	6 49·0	6 50·1	6 30·4	1·6	0·7	7·6	3·5	13·6	6·2
17	6 49·3	6 50·4	6 30·6	1·7	0·8	7·7	3·5	13·7	6·3
18	6 49·5	6 50·6	6 30·8	1·8	0·8	7·8	3·6	13·8	6·3
19	6 49·8	6 50·9	6 31·1	1·9	0·9	7·9	3·6	13·9	6·4
20	6 50·0	6 51·1	6 31·3	2·0	0·9	8·0	3·7	14·0	6·4
21	6 50·3	6 51·4	6 31·6	2·1	1·0	8·1	3·7	14·1	6·5
22	6 50·5	6 51·6	6 31·8	2·2	1·0	8·2	3·8	14·2	6·5
23	6 50·8	6 51·9	6 32·0	2·3	1·1	8·3	3·8	14·3	6·6
24	6 51·0	6 52·1	6 32·3	2·4	1·1	8·4	3·9	14·4	6·6
25	6 51·3	6 52·4	6 32·5	2·5	1·1	8·5	3·9	14·5	6·6
26	6 51·5	6 52·6	6 32·8	2·6	1·2	8·6	3·9	14·6	6·7
27	6 51·8	6 52·9	6 33·0	2·7	1·2	8·7	4·0	14·7	6·7
28	6 52·0	6 53·1	6 33·2	2·8	1·3	8·8	4·0	14·8	6·8
29	6 52·3	6 53·4	6 33·5	2·9	1·3	8·9	4·1	14·9	6·8
30	6 52·5	6 53·6	6 33·7	3·0	1·4	9·0	4·1	15·0	6·9
31	6 52·8	6 53·9	6 33·9	3·1	1·4	9·1	4·2	15·1	6·9
32	6 53·0	6 54·1	6 34·2	3·2	1·5	9·2	4·2	15·2	7·0
33	6 53·3	6 54·4	6 34·4	3·3	1·5	9·3	4·3	15·3	7·0
34	6 53·5	6 54·6	6 34·7	3·4	1·6	9·4	4·3	15·4	7·1
35	6 53·8	6 54·9	6 34·9	3·5	1·6	9·5	4·4	15·5	7·1
36	6 54·0	6 55·1	6 35·1	3·6	1·7	9·6	4·4	15·6	7·2
37	6 54·3	6 55·4	6 35·4	3·7	1·7	9·7	4·4	15·7	7·2
38	6 54·5	6 55·6	6 35·6	3·8	1·7	9·8	4·5	15·8	7·2
39	6 54·8	6 55·9	6 35·9	3·9	1·8	9·9	4·5	15·9	7·3
40	6 55·0	6 56·1	6 36·1	4·0	1·8	10·0	4·6	16·0	7·3
41	6 55·3	6 56·4	6 36·3	4·1	1·9	10·1	4·6	16·1	7·4
42	6 55·5	6 56·6	6 36·6	4·2	1·9	10·2	4·7	16·2	7·4
43	6 55·8	6 56·9	6 36·8	4·3	2·0	10·3	4·7	16·3	7·5
44	6 56·0	6 57·1	6 37·0	4·4	2·0	10·4	4·8	16·4	7·5
45	6 56·3	6 57·4	6 37·3	4·5	2·1	10·5	4·8	16·5	7·6
46	6 56·5	6 57·6	6 37·5	4·6	2·1	10·6	4·9	16·6	7·6
47	6 56·8	6 57·9	6 37·8	4·7	2·2	10·7	4·9	16·7	7·7
48	6 57·0	6 58·1	6 38·0	4·8	2·2	10·8	5·0	16·8	7·7
49	6 57·3	6 58·4	6 38·2	4·9	2·2	10·9	5·0	16·9	7·7
50	6 57·5	6 58·6	6 38·5	5·0	2·3	11·0	5·0	17·0	7·8
51	6 57·8	6 58·9	6 38·7	5·1	2·3	11·1	5·1	17·1	7·8
52	6 58·0	6 59·1	6 39·0	5·2	2·4	11·2	5·1	17·2	7·9
53	6 58·3	6 59·4	6 39·2	5·3	2·4	11·3	5·2	17·3	7·9
54	6 58·5	6 59·6	6 39·4	5·4	2·5	11·4	5·2	17·4	8·0
55	6 58·8	6 59·9	6 39·7	5·5	2·5	11·5	5·3	17·5	8·0
56	6 59·0	7 00·1	6 39·9	5·6	2·6	11·6	5·3	17·6	8·1
57	6 59·3	7 00·4	6 40·2	5·7	2·6	11·7	5·4	17·7	8·1
58	6 59·5	7 00·6	6 40·4	5·8	2·7	11·8	5·4	17·8	8·2
59	6 59·8	7 00·9	6 40·6	5·9	2·7	11·9	5·5	17·9	8·2
60	7 00·0	7 01·1	6 40·9	6·0	2·8	12·0	5·5	18·0	8·3

28m	SOL PLANETAS	ARIES	LUNA	v o d	Corrn	v o d	Corrn	v o d	Corrn
s	° ′	° ′	° ′	′	′	′	′	′	′
00	7 00·0	7 01·1	6 40·9	0·0	0·0	6·0	2·9	12·0	5·7
01	7 00·3	7 01·4	6 41·1	0·1	0·0	6·1	2·9	12·1	5·7
02	7 00·5	7 01·7	6 41·3	0·2	0·1	6·2	2·9	12·2	5·8
03	7 00·8	7 01·9	6 41·6	0·3	0·1	6·3	3·0	12·3	5·8
04	7 01·0	7 02·2	6 41·8	0·4	0·2	6·4	3·0	12·4	5·9
05	7 01·3	7 02·4	6 42·1	0·5	0·2	6·5	3·1	12·5	5·9
06	7 01·5	7 02·7	6 42·3	0·6	0·3	6·6	3·1	12·6	6·0
07	7 01·8	7 02·9	6 42·5	0·7	0·3	6·7	3·2	12·7	6·0
08	7 02·0	7 03·2	6 42·8	0·8	0·4	6·8	3·2	12·8	6·1
09	7 02·3	7 03·4	6 43·0	0·9	0·4	6·9	3·3	12·9	6·1
10	7 02·5	7 03·7	6 43·3	1·0	0·5	7·0	3·3	13·0	6·2
11	7 02·8	7 03·9	6 43·5	1·1	0·5	7·1	3·4	13·1	6·2
12	7 03·0	7 04·2	6 43·7	1·2	0·6	7·2	3·4	13·2	6·3
13	7 03·3	7 04·4	6 44·0	1·3	0·6	7·3	3·5	13·3	6·3
14	7 03·5	7 04·7	6 44·2	1·4	0·7	7·4	3·5	13·4	6·4
15	7 03·8	7 04·9	6 44·4	1·5	0·7	7·5	3·6	13·5	6·4
16	7 04·0	7 05·2	6 44·7	1·6	0·8	7·6	3·6	13·6	6·5
17	7 04·3	7 05·4	6 44·9	1·7	0·8	7·7	3·7	13·7	6·5
18	7 04·5	7 05·7	6 45·2	1·8	0·9	7·8	3·7	13·8	6·6
19	7 04·8	7 05·9	6 45·4	1·9	0·9	7·9	3·8	13·9	6·6
20	7 05·0	7 06·2	6 45·6	2·0	1·0	8·0	3·8	14·0	6·7
21	7 05·3	7 06·4	6 45·9	2·1	1·0	8·1	3·8	14·1	6·7
22	7 05·5	7 06·7	6 46·1	2·2	1·0	8·2	3·9	14·2	6·7
23	7 05·8	7 06·9	6 46·4	2·3	1·1	8·3	3·9	14·3	6·8
24	7 06·0	7 07·2	6 46·6	2·4	1·1	8·4	4·0	14·4	6·8
25	7 06·3	7 07·4	6 46·8	2·5	1·2	8·5	4·0	14·5	6·9
26	7 06·5	7 07·7	6 47·1	2·6	1·2	8·6	4·1	14·6	6·9
27	7 06·8	7 07·9	6 47·3	2·7	1·3	8·7	4·1	14·7	7·0
28	7 07·0	7 08·2	6 47·5	2·8	1·3	8·8	4·2	14·8	7·0
29	7 07·3	7 08·4	6 47·8	2·9	1·4	8·9	4·2	14·9	7·1
30	7 07·5	7 08·7	6 48·0	3·0	1·4	9·0	4·3	15·0	7·1
31	7 07·8	7 08·9	6 48·3	3·1	1·5	9·1	4·3	15·1	7·2
32	7 08·0	7 09·2	6 48·5	3·2	1·5	9·2	4·4	15·2	7·2
33	7 08·3	7 09·4	6 48·7	3·3	1·6	9·3	4·4	15·3	7·3
34	7 08·5	7 09·7	6 49·0	3·4	1·6	9·4	4·5	15·4	7·3
35	7 08·8	7 09·9	6 49·2	3·5	1·7	9·5	4·5	15·5	7·4
36	7 09·0	7 10·2	6 49·5	3·6	1·7	9·6	4·6	15·6	7·4
37	7 09·3	7 10·4	6 49·7	3·7	1·8	9·7	4·6	15·7	7·5
38	7 09·5	7 10·7	6 49·9	3·8	1·8	9·8	4·7	15·8	7·5
39	7 09·8	7 10·9	6 50·2	3·9	1·9	9·9	4·7	15·9	7·6
40	7 10·0	7 11·2	6 50·4	4·0	1·9	10·0	4·8	16·0	7·6
41	7 10·3	7 11·4	6 50·6	4·1	1·9	10·1	4·8	16·1	7·6
42	7 10·5	7 11·7	6 50·9	4·2	2·0	10·2	4·8	16·2	7·7
43	7 10·8	7 11·9	6 51·1	4·3	2·0	10·3	4·9	16·3	7·7
44	7 11·0	7 12·2	6 51·4	4·4	2·1	10·4	4·9	16·4	7·8
45	7 11·3	7 12·4	6 51·6	4·5	2·1	10·5	5·0	16·5	7·8
46	7 11·5	7 12·7	6 51·8	4·6	2·2	10·6	5·0	16·6	7·9
47	7 11·8	7 12·9	6 52·1	4·7	2·2	10·7	5·1	16·7	7·9
48	7 12·0	7 13·2	6 52·3	4·8	2·3	10·8	5·1	16·8	8·0
49	7 12·3	7 13·4	6 52·6	4·9	2·3	10·9	5·2	16·9	8·0
50	7 12·5	7 13·7	6 52·8	5·0	2·4	11·0	5·2	17·0	8·1
51	7 12·8	7 13·9	6 53·0	5·1	2·4	11·1	5·3	17·1	8·1
52	7 13·0	7 14·2	6 53·3	5·2	2·5	11·2	5·3	17·2	8·2
53	7 13·3	7 14·4	6 53·5	5·3	2·5	11·3	5·4	17·3	8·2
54	7 13·5	7 14·7	6 53·8	5·4	2·6	11·4	5·4	17·4	8·3
55	7 13·8	7 14·9	6 54·0	5·5	2·6	11·5	5·5	17·5	8·3
56	7 14·0	7 15·2	6 54·2	5·6	2·7	11·6	5·5	17·6	8·4
57	7 14·3	7 15·4	6 54·5	5·7	2·7	11·7	5·6	17·7	8·4
58	7 14·5	7 15·7	6 54·7	5·8	2·8	11·8	5·6	17·8	8·5
59	7 14·8	7 15·9	6 54·9	5·9	2·8	11·9	5·7	17·9	8·5
60	7 15·0	7 16·2	6 55·2	6·0	2·9	12·0	5·7	18·0	8·6

29m	SOL PLANETAS	ARIES	LUNA	v o d	Corrn	v o d	Corrn	v o d	Corrn
s	° ′	° ′	° ′	′	′	′	′	′	′
00	7 15·0	7 16·2	6 55·2	0·0	0·0	6·0	3·0	12·0	5·9
01	7 15·3	7 16·4	6 55·4	0·1	0·0	6·1	3·0	12·1	5·9
02	7 15·5	7 16·7	6 55·7	0·2	0·1	6·2	3·0	12·2	6·0
03	7 15·8	7 16·9	6 55·9	0·3	0·1	6·3	3·1	12·3	6·0
04	7 16·0	7 17·2	6 56·1	0·4	0·2	6·4	3·1	12·4	6·1
05	7 16·3	7 17·4	6 56·4	0·5	0·2	6·5	3·2	12·5	6·1
06	7 16·5	7 17·7	6 56·6	0·6	0·3	6·6	3·2	12·6	6·2
07	7 16·8	7 17·9	6 56·9	0·7	0·3	6·7	3·3	12·7	6·2
08	7 17·0	7 18·2	6 57·1	0·8	0·4	6·8	3·3	12·8	6·3
09	7 17·3	7 18·4	6 57·3	0·9	0·4	6·9	3·4	12·9	6·3
10	7 17·5	7 18·7	6 57·6	1·0	0·5	7·0	3·4	13·0	6·4
11	7 17·8	7 18·9	6 57·8	1·1	0·5	7·1	3·5	13·1	6·4
12	7 18·0	7 19·2	6 58·0	1·2	0·6	7·2	3·5	13·2	6·5
13	7 18·3	7 19·4	6 58·3	1·3	0·6	7·3	3·6	13·3	6·5
14	7 18·5	7 19·7	6 58·5	1·4	0·7	7·4	3·6	13·4	6·6
15	7 18·8	7 20·0	6 58·8	1·5	0·7	7·5	3·7	13·5	6·6
16	7 19·0	7 20·2	6 59·0	1·6	0·8	7·6	3·7	13·6	6·7
17	7 19·3	7 20·5	6 59·2	1·7	0·8	7·7	3·8	13·7	6·7
18	7 19·5	7 20·7	6 59·5	1·8	0·9	7·8	3·8	13·8	6·8
19	7 19·8	7 21·0	6 59·7	1·9	0·9	7·9	3·9	13·9	6·8
20	7 20·0	7 21·2	7 00·0	2·0	1·0	8·0	3·9	14·0	6·9
21	7 20·3	7 21·5	7 00·2	2·1	1·0	8·1	4·0	14·1	6·9
22	7 20·5	7 21·7	7 00·4	2·2	1·1	8·2	4·0	14·2	7·0
23	7 20·8	7 22·0	7 00·7	2·3	1·1	8·3	4·1	14·3	7·0
24	7 21·0	7 22·2	7 00·9	2·4	1·2	8·4	4·1	14·4	7·1
25	7 21·3	7 22·5	7 01·1	2·5	1·2	8·5	4·2	14·5	7·1
26	7 21·5	7 22·7	7 01·4	2·6	1·3	8·6	4·2	14·6	7·2
27	7 21·8	7 23·0	7 01·6	2·7	1·3	8·7	4·3	14·7	7·2
28	7 22·0	7 23·2	7 01·9	2·8	1·4	8·8	4·3	14·8	7·3
29	7 22·3	7 23·5	7 02·1	2·9	1·4	8·9	4·4	14·9	7·3
30	7 22·5	7 23·7	7 02·3	3·0	1·5	9·0	4·4	15·0	7·4
31	7 22·8	7 24·0	7 02·6	3·1	1·5	9·1	4·5	15·1	7·4
32	7 23·0	7 24·2	7 02·8	3·2	1·6	9·2	4·5	15·2	7·5
33	7 23·3	7 24·5	7 03·1	3·3	1·6	9·3	4·6	15·3	7·5
34	7 23·5	7 24·7	7 03·3	3·4	1·7	9·4	4·6	15·4	7·6
35	7 23·8	7 25·0	7 03·5	3·5	1·7	9·5	4·7	15·5	7·6
36	7 24·0	7 25·2	7 03·8	3·6	1·8	9·6	4·7	15·6	7·7
37	7 24·3	7 25·5	7 04·0	3·7	1·8	9·7	4·8	15·7	7·7
38	7 24·5	7 25·7	7 04·3	3·8	1·9	9·8	4·8	15·8	7·8
39	7 24·8	7 26·0	7 04·5	3·9	1·9	9·9	4·9	15·9	7·8
40	7 25·0	7 26·2	7 04·7	4·0	2·0	10·0	4·9	16·0	7·9
41	7 25·3	7 26·5	7 05·0	4·1	2·0	10·1	5·0	16·1	7·9
42	7 25·5	7 26·7	7 05·2	4·2	2·1	10·2	5·0	16·2	8·0
43	7 25·8	7 27·0	7 05·4	4·3	2·1	10·3	5·1	16·3	8·0
44	7 26·0	7 27·2	7 05·7	4·4	2·2	10·4	5·1	16·4	8·1
45	7 26·3	7 27·5	7 05·9	4·5	2·2	10·5	5·2	16·5	8·1
46	7 26·5	7 27·7	7 06·2	4·6	2·3	10·6	5·2	16·6	8·2
47	7 26·8	7 28·0	7 06·4	4·7	2·3	10·7	5·3	16·7	8·2
48	7 27·0	7 28·2	7 06·6	4·8	2·4	10·8	5·3	16·8	8·3
49	7 27·3	7 28·5	7 06·9	4·9	2·4	10·9	5·4	16·9	8·3
50	7 27·5	7 28·7	7 07·1	5·0	2·5	11·0	5·4	17·0	8·4
51	7 27·8	7 29·0	7 07·4	5·1	2·5	11·1	5·5	17·1	8·4
52	7 28·0	7 29·2	7 07·6	5·2	2·6	11·2	5·5	17·2	8·5
53	7 28·3	7 29·5	7 07·8	5·3	2·6	11·3	5·6	17·3	8·5
54	7 28·5	7 29·7	7 08·1	5·4	2·7	11·4	5·6	17·4	8·6
55	7 28·8	7 30·0	7 08·3	5·5	2·7	11·5	5·7	17·5	8·6
56	7 29·0	7 30·2	7 08·5	5·6	2·8	11·6	5·7	17·6	8·7
57	7 29·3	7 30·5	7 08·8	5·7	2·8	11·7	5·8	17·7	8·7
58	7 29·5	7 30·7	7 09·0	5·8	2·9	11·8	5·8	17·8	8·8
59	7 29·8	7 31·0	7 09·3	5·9	2·9	11·9	5·9	17·9	8·8
60	7 30·0	7 31·2	7 09·5	6·0	3·0	12·0	5·9	18·0	8·9

30m	SOL PLANETAS	ARIES	LUNA	v o d Corrn		v o d Corrn		v o d Corrn	
s	° ′	° ′	° ′	′	′	′	′	′	′
00	7 30·0	7 31·2	7 09·5	0·0	0·0	6·0	3·1	12·0	6·1
01	7 30·3	7 31·5	7 09·7	0·1	0·1	6·1	3·1	12·1	6·2
02	7 30·5	7 31·7	7 10·0	0·2	0·1	6·2	3·2	12·2	6·2
03	7 30·8	7 32·0	7 10·2	0·3	0·2	6·3	3·2	12·3	6·3
04	7 31·0	7 32·2	7 10·5	0·4	0·2	6·4	3·3	12·4	6·3
05	7 31·3	7 32·5	7 10·7	0·5	0·3	6·5	3·3	12·5	6·4
06	7 31·5	7 32·7	7 10·9	0·6	0·3	6·6	3·4	12·6	6·4
07	7 31·8	7 33·0	7 11·2	0·7	0·4	6·7	3·4	12·7	6·5
08	7 32·0	7 33·2	7 11·4	0·8	0·4	6·8	3·5	12·8	6·5
09	7 32·3	7 33·5	7 11·6	0·9	0·5	6·9	3·5	12·9	6·6
10	7 32·5	7 33·7	7 11·9	1·0	0·5	7·0	3·6	13·0	6·6
11	7 32·8	7 34·0	7 12·1	1·1	0·6	7·1	3·6	13·1	6·7
12	7 33·0	7 34·2	7 12·4	1·2	0·6	7·2	3·7	13·2	6·7
13	7 33·3	7 34·5	7 12·6	1·3	0·7	7·3	3·7	13·3	6·8
14	7 33·5	7 34·7	7 12·8	1·4	0·7	7·4	3·8	13·4	6·8
15	7 33·8	7 35·0	7 13·1	1·5	0·8	7·5	3·8	13·5	6·9
16	7 34·0	7 35·2	7 13·3	1·6	0·8	7·6	3·9	13·6	6·9
17	7 34·3	7 35·5	7 13·6	1·7	0·9	7·7	3·9	13·7	7·0
18	7 34·5	7 35·7	7 13·8	1·8	0·9	7·8	4·0	13·8	7·0
19	7 34·8	7 36·0	7 14·0	1·9	1·0	7·9	4·0	13·9	7·1
20	7 35·0	7 36·2	7 14·3	2·0	1·0	8·0	4·1	14·0	7·1
21	7 35·3	7 36·5	7 14·5	2·1	1·1	8·1	4·1	14·1	7·2
22	7 35·5	7 36·7	7 14·7	2·2	1·1	8·2	4·2	14·2	7·2
23	7 35·8	7 37·0	7 15·0	2·3	1·2	8·3	4·2	14·3	7·3
24	7 36·0	7 37·2	7 15·2	2·4	1·2	8·4	4·3	14·4	7·3
25	7 36·3	7 37·5	7 15·5	2·5	1·3	8·5	4·3	14·5	7·4
26	7 36·5	7 37·7	7 15·7	2·6	1·3	8·6	4·4	14·6	7·4
27	7 36·8	7 38·0	7 15·9	2·7	1·4	8·7	4·4	14·7	7·5
28	7 37·0	7 38·3	7 16·2	2·8	1·4	8·8	4·5	14·8	7·5
29	7 37·3	7 38·5	7 16·4	2·9	1·5	8·9	4·5	14·9	7·6
30	7 37·5	7 38·8	7 16·7	3·0	1·5	9·0	4·6	15·0	7·6
31	7 37·8	7 39·0	7 16·9	3·1	1·6	9·1	4·6	15·1	7·7
32	7 38·0	7 39·3	7 17·1	3·2	1·6	9·2	4·7	15·2	7·7
33	7 38·3	7 39·5	7 17·4	3·3	1·7	9·3	4·7	15·3	7·8
34	7 38·5	7 39·8	7 17·6	3·4	1·7	9·4	4·8	15·4	7·8
35	7 38·8	7 40·0	7 17·9	3·5	1·8	9·5	4·8	15·5	7·9
36	7 39·0	7 40·3	7 18·1	3·6	1·8	9·6	4·9	15·6	7·9
37	7 39·3	7 40·5	7 18·3	3·7	1·9	9·7	4·9	15·7	8·0
38	7 39·5	7 40·8	7 18·6	3·8	1·9	9·8	5·0	15·8	8·0
39	7 39·8	7 41·0	7 18·8	3·9	2·0	9·9	5·0	15·9	8·1
40	7 40·0	7 41·3	7 19·0	4·0	2·0	10·0	5·1	16·0	8·1
41	7 40·3	7 41·5	7 19·3	4·1	2·1	10·1	5·1	16·1	8·2
42	7 40·5	7 41·8	7 19·5	4·2	2·1	10·2	5·2	16·2	8·2
43	7 40·8	7 42·0	7 19·8	4·3	2·2	10·3	5·2	16·3	8·3
44	7 41·0	7 42·3	7 20·0	4·4	2·2	10·4	5·3	16·4	8·3
45	7 41·3	7 42·5	7 20·2	4·5	2·3	10·5	5·3	16·5	8·4
46	7 41·5	7 42·8	7 20·5	4·6	2·3	10·6	5·4	16·6	8·4
47	7 41·8	7 43·0	7 20·7	4·7	2·4	10·7	5·4	16·7	8·5
48	7 42·0	7 43·3	7 21·0	4·8	2·4	10·8	5·5	16·8	8·5
49	7 42·3	7 43·5	7 21·2	4·9	2·5	10·9	5·5	16·9	8·6
50	7 42·5	7 43·8	7 21·4	5·0	2·5	11·0	5·6	17·0	8·6
51	7 42·8	7 44·0	7 21·7	5·1	2·6	11·1	5·6	17·1	8·7
52	7 43·0	7 44·3	7 21·9	5·2	2·6	11·2	5·7	17·2	8·7
53	7 43·3	7 44·5	7 22·1	5·3	2·7	11·3	5·7	17·3	8·8
54	7 43·5	7 44·8	7 22·4	5·4	2·7	11·4	5·8	17·4	8·8
55	7 43·8	7 45·0	7 22·6	5·5	2·8	11·5	5·8	17·5	8·9
56	7 44·0	7 45·3	7 22·9	5·6	2·8	11·6	5·9	17·6	8·9
57	7 44·3	7 45·5	7 23·1	5·7	2·9	11·7	5·9	17·7	9·0
58	7 44·5	7 45·8	7 23·3	5·8	2·9	11·8	6·0	17·8	9·0
59	7 44·8	7 46·0	7 23·6	5·9	3·0	11·9	6·0	17·9	9·1
60	7 45·0	7 46·3	7 23·8	6·0	3·1	12·0	6·1	18·0	9·2

31m	SOL PLANETAS	ARIES	LUNA	v o d Corrn		v o d Corrn		v o d Corrn	
s	° ′	° ′	° ′	′	′	′	′	′	′
00	7 45·0	7 46·3	7 23·8	0·0	0·0	6·0	3·2	12·0	6·3
01	7 45·3	7 46·5	7 24·1	0·1	0·1	6·1	3·2	12·1	6·4
02	7 45·5	7 46·8	7 24·3	0·2	0·1	6·2	3·3	12·2	6·4
03	7 45·8	7 47·0	7 24·5	0·3	0·2	6·3	3·3	12·3	6·5
04	7 46·0	7 47·3	7 24·8	0·4	0·2	6·4	3·4	12·4	6·5
05	7 46·3	7 47·5	7 25·0	0·5	0·3	6·5	3·4	12·5	6·6
06	7 46·5	7 47·8	7 25·2	0·6	0·3	6·6	3·5	12·6	6·6
07	7 46·8	7 48·0	7 25·5	0·7	0·4	6·7	3·5	12·7	6·7
08	7 47·0	7 48·3	7 25·7	0·8	0·4	6·8	3·6	12·8	6·7
09	7 47·3	7 48·5	7 26·0	0·9	0·5	6·9	3·6	12·9	6·8
10	7 47·5	7 48·8	7 26·2	1·0	0·5	7·0	3·7	13·0	6·8
11	7 47·8	7 49·0	7 26·4	1·1	0·6	7·1	3·7	13·1	6·9
12	7 48·0	7 49·3	7 26·7	1·2	0·6	7·2	3·8	13·2	6·9
13	7 48·3	7 49·5	7 26·9	1·3	0·7	7·3	3·8	13·3	7·0
14	7 48·5	7 49·8	7 27·2	1·4	0·7	7·4	3·9	13·4	7·0
15	7 48·8	7 50·0	7 27·4	1·5	0·8	7·5	3·9	13·5	7·1
16	7 49·0	7 50·3	7 27·6	1·6	0·8	7·6	4·0	13·6	7·1
17	7 49·3	7 50·5	7 27·9	1·7	0·9	7·7	4·0	13·7	7·2
18	7 49·5	7 50·8	7 28·1	1·8	0·9	7·8	4·1	13·8	7·2
19	7 49·8	7 51·0	7 28·4	1·9	1·0	7·9	4·1	13·9	7·3
20	7 50·0	7 51·3	7 28·6	2·0	1·1	8·0	4·2	14·0	7·4
21	7 50·3	7 51·5	7 28·8	2·1	1·1	8·1	4·3	14·1	7·4
22	7 50·5	7 51·8	7 29·1	2·2	1·2	8·2	4·3	14·2	7·5
23	7 50·8	7 52·0	7 29·3	2·3	1·2	8·3	4·4	14·3	7·5
24	7 51·0	7 52·3	7 29·5	2·4	1·3	8·4	4·4	14·4	7·6
25	7 51·3	7 52·5	7 29·8	2·5	1·3	8·5	4·5	14·5	7·6
26	7 51·5	7 52·8	7 30·0	2·6	1·4	8·6	4·5	14·6	7·7
27	7 51·8	7 53·0	7 30·3	2·7	1·4	8·7	4·6	14·7	7·7
28	7 52·0	7 53·3	7 30·5	2·8	1·5	8·8	4·6	14·8	7·8
29	7 52·3	7 53·5	7 30·7	2·9	1·5	8·9	4·7	14·9	7·8
30	7 52·5	7 53·8	7 31·0	3·0	1·6	9·0	4·7	15·0	7·9
31	7 52·8	7 54·0	7 31·2	3·1	1·6	9·1	4·8	15·1	7·9
32	7 53·0	7 54·3	7 31·5	3·2	1·7	9·2	4·8	15·2	8·0
33	7 53·3	7 54·5	7 31·7	3·3	1·7	9·3	4·9	15·3	8·0
34	7 53·5	7 54·8	7 31·9	3·4	1·8	9·4	4·9	15·4	8·1
35	7 53·8	7 55·0	7 32·2	3·5	1·8	9·5	5·0	15·5	8·1
36	7 54·0	7 55·3	7 32·4	3·6	1·9	9·6	5·0	15·6	8·2
37	7 54·3	7 55·5	7 32·6	3·7	1·9	9·7	5·1	15·7	8·2
38	7 54·5	7 55·8	7 32·9	3·8	2·0	9·8	5·1	15·8	8·3
39	7 54·8	7 56·0	7 33·1	3·9	2·0	9·9	5·2	15·9	8·3
40	7 55·0	7 56·3	7 33·4	4·0	2·1	10·0	5·3	16·0	8·4
41	7 55·3	7 56·6	7 33·6	4·1	2·2	10·1	5·3	16·1	8·5
42	7 55·5	7 56·8	7 33·8	4·2	2·2	10·2	5·4	16·2	8·5
43	7 55·8	7 57·1	7 34·1	4·3	2·3	10·3	5·4	16·3	8·6
44	7 56·0	7 57·3	7 34·3	4·4	2·3	10·4	5·5	16·4	8·6
45	7 56·3	7 57·6	7 34·6	4·5	2·4	10·5	5·5	16·5	8·7
46	7 56·5	7 57·8	7 34·8	4·6	2·4	10·6	5·6	16·6	8·7
47	7 56·8	7 58·1	7 35·0	4·7	2·5	10·7	5·6	16·7	8·8
48	7 57·0	7 58·3	7 35·3	4·8	2·5	10·8	5·7	16·8	8·8
49	7 57·3	7 58·6	7 35·5	4·9	2·6	10·9	5·7	16·9	8·9
50	7 57·5	7 58·8	7 35·7	5·0	2·6	11·0	5·8	17·0	8·9
51	7 57·8	7 59·1	7 36·0	5·1	2·7	11·1	5·8	17·1	9·0
52	7 58·0	7 59·3	7 36·2	5·2	2·7	11·2	5·9	17·2	9·0
53	7 58·3	7 59·6	7 36·5	5·3	2·8	11·3	5·9	17·3	9·1
54	7 58·5	7 59·8	7 36·7	5·4	2·8	11·4	6·0	17·4	9·1
55	7 58·8	8 00·1	7 36·9	5·5	2·9	11·5	6·0	17·5	9·2
56	7 59·0	8 00·3	7 37·2	5·6	2·9	11·6	6·1	17·6	9·2
57	7 59·3	8 00·6	7 37·4	5·7	3·0	11·7	6·1	17·7	9·3
58	7 59·5	8 00·8	7 37·7	5·8	3·0	11·8	6·2	17·8	9·3
59	7 59·8	8 01·1	7 37·9	5·9	3·1	11·9	6·2	17·9	9·4
60	8 00·0	8 01·3	7 38·1	6·0	3·2	12·0	6·3	18·0	9·5

32m	SOL PLANETAS	ARIES	LUNA	v o d Corrn		v o d Corrn		v o d Corrn	
s	° ′	° ′	° ′	′	′	′	′	′	′
00	8 00·0	8 01·3	7 38·1	0·0	0·0	6·0	3·3	12·0	6·5
01	8 00·3	8 01·6	7 38·4	0·1	0·1	6·1	3·3	12·1	6·6
02	8 00·5	8 01·8	7 38·6	0·2	0·1	6·2	3·4	12·2	6·6
03	8 00·8	8 02·1	7 38·8	0·3	0·2	6·3	3·4	12·3	6·7
04	8 01·0	8 02·3	7 39·1	0·4	0·2	6·4	3·5	12·4	6·7
05	8 01·3	8 02·6	7 39·3	0·5	0·3	6·5	3·5	12·5	6·8
06	8 01·5	8 02·8	7 39·6	0·6	0·3	6·6	3·6	12·6	6·8
07	8 01·8	8 03·1	7 39·8	0·7	0·4	6·7	3·6	12·7	6·9
08	8 02·0	8 03·3	7 40·0	0·8	0·4	6·8	3·7	12·8	6·9
09	8 02·3	8 03·6	7 40·3	0·9	0·5	6·9	3·7	12·9	7·0
10	8 02·5	8 03·8	7 40·5	1·0	0·5	7·0	3·8	13·0	7·0
11	8 02·8	8 04·1	7 40·8	1·1	0·6	7·1	3·8	13·1	7·1
12	8 03·0	8 04·3	7 41·0	1·2	0·7	7·2	3·9	13·2	7·2
13	8 03·3	8 04·6	7 41·2	1·3	0·7	7·3	4·0	13·3	7·2
14	8 03·5	8 04·8	7 41·5	1·4	0·8	7·4	4·0	13·4	7·3
15	8 03·8	8 05·1	7 41·7	1·5	0·8	7·5	4·1	13·5	7·3
16	8 04·0	8 05·3	7 42·0	1·6	0·9	7·6	4·1	13·6	7·4
17	8 04·3	8 05·6	7 42·2	1·7	0·9	7·7	4·2	13·7	7·4
18	8 04·5	8 05·8	7 42·4	1·8	1·0	7·8	4·2	13·8	7·5
19	8 04·8	8 06·1	7 42·7	1·9	1·0	7·9	4·3	13·9	7·5
20	8 05·0	8 06·3	7 42·9	2·0	1·1	8·0	4·3	14·0	7·6
21	8 05·3	8 06·6	7 43·1	2·1	1·1	8·1	4·4	14·1	7·6
22	8 05·5	8 06·8	7 43·4	2·2	1·2	8·2	4·4	14·2	7·7
23	8 05·8	8 07·1	7 43·6	2·3	1·2	8·3	4·5	14·3	7·7
24	8 06·0	8 07·3	7 43·9	2·4	1·3	8·4	4·6	14·4	7·8
25	8 06·3	8 07·6	7 44·1	2·5	1·4	8·5	4·6	14·5	7·9
26	8 06·5	8 07·8	7 44·3	2·6	1·4	8·6	4·7	14·6	7·9
27	8 06·8	8 08·1	7 44·6	2·7	1·5	8·7	4·7	14·7	8·0
28	8 07·0	8 08·3	7 44·8	2·8	1·5	8·8	4·8	14·8	8·0
29	8 07·3	8 08·6	7 45·1	2·9	1·6	8·9	4·8	14·9	8·1
30	8 07·5	8 08·8	7 45·3	3·0	1·6	9·0	4·9	15·0	8·1
31	8 07·8	8 09·1	7 45·5	3·1	1·7	9·1	4·9	15·1	8·2
32	8 08·0	8 09·3	7 45·8	3·2	1·7	9·2	5·0	15·2	8·2
33	8 08·3	8 09·6	7 46·0	3·3	1·8	9·3	5·0	15·3	8·3
34	8 08·5	8 09·8	7 46·2	3·4	1·8	9·4	5·1	15·4	8·3
35	8 08·8	8 10·1	7 46·5	3·5	1·9	9·5	5·1	15·5	8·4
36	8 09·0	8 10·3	7 46·7	3·6	2·0	9·6	5·2	15·6	8·5
37	8 09·3	8 10·6	7 47·0	3·7	2·0	9·7	5·3	15·7	8·5
38	8 09·5	8 10·8	7 47·2	3·8	2·1	9·8	5·3	15·8	8·6
39	8 09·8	8 11·1	7 47·4	3·9	2·1	9·9	5·4	15·9	8·6
40	8 10·0	8 11·3	7 47·7	4·0	2·2	10·0	5·4	16·0	8·7
41	8 10·3	8 11·6	7 47·9	4·1	2·2	10·1	5·5	16·1	8·7
42	8 10·5	8 11·8	7 48·2	4·2	2·3	10·2	5·5	16·2	8·8
43	8 10·8	8 12·1	7 48·4	4·3	2·3	10·3	5·6	16·3	8·8
44	8 11·0	8 12·3	7 48·6	4·4	2·4	10·4	5·6	16·4	8·9
45	8 11·3	8 12·6	7 48·9	4·5	2·4	10·5	5·7	16·5	8·9
46	8 11·5	8 12·8	7 49·1	4·6	2·5	10·6	5·7	16·6	9·0
47	8 11·8	8 13·1	7 49·3	4·7	2·5	10·7	5·8	16·7	9·0
48	8 12·0	8 13·3	7 49·6	4·8	2·6	10·8	5·9	16·8	9·1
49	8 12·3	8 13·6	7 49·8	4·9	2·7	10·9	5·9	16·9	9·2
50	8 12·5	8 13·8	7 50·1	5·0	2·7	11·0	6·0	17·0	9·2
51	8 12·8	8 14·1	7 50·3	5·1	2·8	11·1	6·0	17·1	9·3
52	8 13·0	8 14·3	7 50·5	5·2	2·8	11·2	6·1	17·2	9·3
53	8 13·3	8 14·6	7 50·8	5·3	2·9	11·3	6·1	17·3	9·4
54	8 13·5	8 14·9	7 51·0	5·4	2·9	11·4	6·2	17·4	9·4
55	8 13·8	8 15·1	7 51·3	5·5	3·0	11·5	6·2	17·5	9·5
56	8 14·0	8 15·4	7 51·5	5·6	3·0	11·6	6·3	17·6	9·5
57	8 14·3	8 15·6	7 51·7	5·7	3·1	11·7	6·3	17·7	9·6
58	8 14·5	8 15·9	7 52·0	5·8	3·1	11·8	6·4	17·8	9·6
59	8 14·8	8 16·1	7 52·2	5·9	3·2	11·9	6·4	17·9	9·7
60	8 15·0	8 16·4	7 52·5	6·0	3·3	12·0	6·5	18·0	9·8

33m	SOL PLANETAS	ARIES	LUNA	v o d Corrn		v o d Corrn		v o d Corrn	
s	° ′	° ′	° ′	′	′	′	′	′	′
00	8 15·0	8 16·4	7 52·5	0·0	0·0	6·0	3·4	12·0	6·7
01	8 15·3	8 16·6	7 52·7	0·1	0·1	6·1	3·4	12·1	6·8
02	8 15·5	8 16·9	7 52·9	0·2	0·1	6·2	3·5	12·2	6·8
03	8 15·8	8 17·1	7 53·2	0·3	0·2	6·3	3·5	12·3	6·9
04	8 16·0	8 17·4	7 53·4	0·4	0·2	6·4	3·6	12·4	6·9
05	8 16·3	8 17·6	7 53·6	0·5	0·3	6·5	3·6	12·5	7·0
06	8 16·5	8 17·9	7 53·9	0·6	0·3	6·6	3·7	12·6	7·0
07	8 16·8	8 18·1	7 54·1	0·7	0·4	6·7	3·7	12·7	7·1
08	8 17·0	8 18·4	7 54·4	0·8	0·4	6·8	3·8	12·8	7·1
09	8 17·3	8 18·6	7 54·6	0·9	0·5	6·9	3·9	12·9	7·2
10	8 17·5	8 18·9	7 54·8	1·0	0·6	7·0	3·9	13·0	7·3
11	8 17·8	8 19·1	7 55·1	1·1	0·6	7·1	4·0	13·1	7·3
12	8 18·0	8 19·4	7 55·3	1·2	0·7	7·2	4·0	13·2	7·4
13	8 18·3	8 19·6	7 55·6	1·3	0·7	7·3	4·1	13·3	7·4
14	8 18·5	8 19·9	7 55·8	1·4	0·8	7·4	4·1	13·4	7·5
15	8 18·8	8 20·1	7 56·0	1·5	0·8	7·5	4·2	13·5	7·5
16	8 19·0	8 20·4	7 56·3	1·6	0·9	7·6	4·2	13·6	7·6
17	8 19·3	8 20·6	7 56·5	1·7	0·9	7·7	4·3	13·7	7·6
18	8 19·5	8 20·9	7 56·7	1·8	1·0	7·8	4·4	13·8	7·7
19	8 19·8	8 21·1	7 57·0	1·9	1·1	7·9	4·4	13·9	7·8
20	8 20·0	8 21·4	7 57·2	2·0	1·1	8·0	4·5	14·0	7·8
21	8 20·3	8 21·6	7 57·5	2·1	1·2	8·1	4·5	14·1	7·9
22	8 20·5	8 21·9	7 57·7	2·2	1·2	8·2	4·6	14·2	7·9
23	8 20·8	8 22·1	7 57·9	2·3	1·3	8·3	4·6	14·3	8·0
24	8 21·0	8 22·4	7 58·2	2·4	1·3	8·4	4·7	14·4	8·0
25	8 21·3	8 22·6	7 58·4	2·5	1·4	8·5	4·7	14·5	8·1
26	8 21·5	8 22·9	7 58·7	2·6	1·5	8·6	4·8	14·6	8·2
27	8 21·8	8 23·1	7 58·9	2·7	1·5	8·7	4·9	14·7	8·2
28	8 22·0	8 23·4	7 59·1	2·8	1·6	8·8	4·9	14·8	8·3
29	8 22·3	8 23·6	7 59·4	2·9	1·6	8·9	5·0	14·9	8·3
30	8 22·5	8 23·9	7 59·6	3·0	1·7	9·0	5·0	15·0	8·4
31	8 22·8	8 24·1	7 59·8	3·1	1·7	9·1	5·1	15·1	8·4
32	8 23·0	8 24·4	8 00·1	3·2	1·8	9·2	5·1	15·2	8·5
33	8 23·3	8 24·6	8 00·3	3·3	1·8	9·3	5·2	15·3	8·5
34	8 23·5	8 24·9	8 00·6	3·4	1·9	9·4	5·2	15·4	8·6
35	8 23·8	8 25·1	8 00·8	3·5	2·0	9·5	5·3	15·5	8·7
36	8 24·0	8 25·4	8 01·0	3·6	2·0	9·6	5·4	15·6	8·7
37	8 24·3	8 25·6	8 01·3	3·7	2·1	9·7	5·4	15·7	8·8
38	8 24·5	8 25·9	8 01·5	3·8	2·1	9·8	5·5	15·8	8·8
39	8 24·8	8 26·1	8 01·8	3·9	2·2	9·9	5·5	15·9	8·9
40	8 25·0	8 26·4	8 02·0	4·0	2·2	10·0	5·6	16·0	8·9
41	8 25·3	8 26·6	8 02·2	4·1	2·3	10·1	5·6	16·1	9·0
42	8 25·5	8 26·9	8 02·5	4·2	2·3	10·2	5·7	16·2	9·0
43	8 25·8	8 27·1	8 02·7	4·3	2·4	10·3	5·8	16·3	9·1
44	8 26·0	8 27·4	8 02·9	4·4	2·5	10·4	5·8	16·4	9·2
45	8 26·3	8 27·6	8 03·2	4·5	2·5	10·5	5·9	16·5	9·2
46	8 26·5	8 27·9	8 03·4	4·6	2·6	10·6	5·9	16·6	9·3
47	8 26·8	8 28·1	8 03·7	4·7	2·6	10·7	6·0	16·7	9·3
48	8 27·0	8 28·4	8 03·9	4·8	2·7	10·8	6·0	16·8	9·4
49	8 27·3	8 28·6	8 04·1	4·9	2·7	10·9	6·1	16·9	9·4
50	8 27·5	8 28·9	8 04·4	5·0	2·8	11·0	6·1	17·0	9·5
51	8 27·8	8 29·1	8 04·6	5·1	2·8	11·1	6·2	17·1	9·5
52	8 28·0	8 29·4	8 04·9	5·2	2·9	11·2	6·3	17·2	9·6
53	8 28·3	8 29·6	8 05·1	5·3	3·0	11·3	6·3	17·3	9·7
54	8 28·5	8 29·9	8 05·3	5·4	3·0	11·4	6·4	17·4	9·7
55	8 28·8	8 30·1	8 05·6	5·5	3·1	11·5	6·4	17·5	9·8
56	8 29·0	8 30·4	8 05·8	5·6	3·1	11·6	6·5	17·6	9·8
57	8 29·3	8 30·6	8 06·1	5·7	3·2	11·7	6·5	17·7	9·9
58	8 29·5	8 30·9	8 06·3	5·8	3·2	11·8	6·6	17·8	9·9
59	8 29·8	8 31·1	8 06·5	5·9	3·3	11·9	6·6	17·9	10·0
60	8 30·0	8 31·4	8 06·8	6·0	3·4	12·0	6·7	18·0	10·1

34m	SOL PLANETAS	ARIES	LUNA	v o d	Corrn	v o d	Corrn	v o d	Corrn
s	° ′	° ′	° ′	′	′	′	′	′	′
00	8 30·0	8 31·4	8 06·8	0·0	0·0	6·0	3·5	12·0	6·9
01	8 30·3	8 31·6	8 07·0	0·1	0·1	6·1	3·5	12·1	7·0
02	8 30·5	8 31·9	8 07·2	0·2	0·1	6·2	3·6	12·2	7·0
03	8 30·8	8 32·1	8 07·5	0·3	0·2	6·3	3·6	12·3	7·1
04	8 31·0	8 32·4	8 07·7	0·4	0·2	6·4	3·7	12·4	7·1
05	8 31·3	8 32·6	8 08·0	0·5	0·3	6·5	3·7	12·5	7·2
06	8 31·5	8 32·9	8 08·2	0·6	0·3	6·6	3·8	12·6	7·2
07	8 31·8	8 33·2	8 08·4	0·7	0·4	6·7	3·9	12·7	7·3
08	8 32·0	8 33·4	8 08·7	0·8	0·5	6·8	3·9	12·8	7·4
09	8 32·3	8 33·7	8 08·9	0·9	0·5	6·9	4·0	12·9	7·4
10	8 32·5	8 33·9	8 09·2	1·0	0·6	7·0	4·0	13·0	7·5
11	8 32·8	8 34·2	8 09·4	1·1	0·6	7·1	4·1	13·1	7·5
12	8 33·0	8 34·4	8 09·6	1·2	0·7	7·2	4·1	13·2	7·6
13	8 33·3	8 34·7	8 09·9	1·3	0·7	7·3	4·2	13·3	7·6
14	8 33·5	8 34·9	8 10·1	1·4	0·8	7·4	4·3	13·4	7·7
15	8 33·8	8 35·2	8 10·3	1·5	0·9	7·5	4·3	13·5	7·8
16	8 34·0	8 35·4	8 10·6	1·6	0·9	7·6	4·4	13·6	7·8
17	8 34·3	8 35·7	8 10·8	1·7	1·0	7·7	4·4	13·7	7·9
18	8 34·5	8 35·9	8 11·1	1·8	1·0	7·8	4·5	13·8	7·9
19	8 34·8	8 36·2	8 11·3	1·9	1·1	7·9	4·5	13·9	8·0
20	8 35·0	8 36·4	8 11·5	2·0	1·2	8·0	4·6	14·0	8·1
21	8 35·3	8 36·7	8 11·8	2·1	1·2	8·1	4·7	14·1	8·1
22	8 35·5	8 36·9	8 12·0	2·2	1·3	8·2	4·7	14·2	8·2
23	8 35·8	8 37·2	8 12·3	2·3	1·3	8·3	4·8	14·3	8·2
24	8 36·0	8 37·4	8 12·5	2·4	1·4	8·4	4·8	14·4	8·3
25	8 36·3	8 37·7	8 12·7	2·5	1·4	8·5	4·9	14·5	8·3
26	8 36·5	8 37·9	8 13·0	2·6	1·5	8·6	4·9	14·6	8·4
27	8 36·8	8 38·2	8 13·2	2·7	1·6	8·7	5·0	14·7	8·5
28	8 37·0	8 38·4	8 13·4	2·8	1·6	8·8	5·1	14·8	8·5
29	8 37·3	8 38·7	8 13·7	2·9	1·7	8·9	5·1	14·9	8·6
30	8 37·5	8 38·9	8 13·9	3·0	1·7	9·0	5·2	15·0	8·6
31	8 37·8	8 39·2	8 14·2	3·1	1·8	9·1	5·2	15·1	8·7
32	8 38·0	8 39·4	8 14·4	3·2	1·8	9·2	5·3	15·2	8·7
33	8 38·3	8 39·7	8 14·6	3·3	1·9	9·3	5·3	15·3	8·8
34	8 38·5	8 39·9	8 14·9	3·4	2·0	9·4	5·4	15·4	8·9
35	8 38·8	8 40·2	8 15·1	3·5	2·0	9·5	5·5	15·5	8·9
36	8 39·0	8 40·4	8 15·4	3·6	2·1	9·6	5·5	15·6	9·0
37	8 39·3	8 40·7	8 15·6	3·7	2·1	9·7	5·6	15·7	9·0
38	8 39·5	8 40·9	8 15·8	3·8	2·2	9·8	5·6	15·8	9·1
39	8 39·8	8 41·2	8 16·1	3·9	2·2	9·9	5·7	15·9	9·1
40	8 40·0	8 41·4	8 16·3	4·0	2·3	10·0	5·8	16·0	9·2
41	8 40·3	8 41·7	8 16·5	4·1	2·4	10·1	5·8	16·1	9·3
42	8 40·5	8 41·9	8 16·8	4·2	2·4	10·2	5·9	16·2	9·3
43	8 40·8	8 42·2	8 17·0	4·3	2·5	10·3	5·9	16·3	9·4
44	8 41·0	8 42·4	8 17·3	4·4	2·5	10·4	6·0	16·4	9·4
45	8 41·3	8 42·7	8 17·5	4·5	2·6	10·5	6·0	16·5	9·5
46	8 41·5	8 42·9	8 17·7	4·6	2·6	10·6	6·1	16·6	9·5
47	8 41·8	8 43·2	8 18·0	4·7	2·7	10·7	6·2	16·7	9·6
48	8 42·0	8 43·4	8 18·2	4·8	2·8	10·8	6·2	16·8	9·7
49	8 42·3	8 43·7	8 18·5	4·9	2·8	10·9	6·3	16·9	9·7
50	8 42·5	8 43·9	8 18·7	5·0	2·9	11·0	6·3	17·0	9·8
51	8 42·8	8 44·2	8 18·9	5·1	2·9	11·1	6·4	17·1	9·8
52	8 43·0	8 44·4	8 19·2	5·2	3·0	11·2	6·4	17·2	9·9
53	8 43·3	8 44·7	8 19·4	5·3	3·0	11·3	6·5	17·3	9·9
54	8 43·5	8 44·9	8 19·7	5·4	3·1	11·4	6·6	17·4	10·0
55	8 43·8	8 45·2	8 19·9	5·5	3·2	11·5	6·6	17·5	10·1
56	8 44·0	8 45·4	8 20·1	5·6	3·2	11·6	6·7	17·6	10·1
57	8 44·3	8 45·7	8 20·4	5·7	3·3	11·7	6·7	17·7	10·2
58	8 44·5	8 45·9	8 20·6	5·8	3·3	11·8	6·8	17·8	10·2
59	8 44·8	8 46·2	8 20·8	5·9	3·4	11·9	6·8	17·9	10·3
60	8 45·0	8 46·4	8 21·1	6·0	3·5	12·0	6·9	18·0	10·4

35m	SOL PLANETAS	ARIES	LUNA	v o d	Corrn	v o d	Corrn	v o d	Corrn
s	° ′	° ′	° ′	′	′	′	′	′	′
00	8 45·0	8 46·4	8 21·1	0·0	0·0	6·0	3·6	12·0	7·1
01	8 45·3	8 46·7	8 21·3	0·1	0·1	6·1	3·6	12·1	7·2
02	8 45·5	8 46·9	8 21·6	0·2	0·1	6·2	3·7	12·2	7·2
03	8 45·8	8 47·2	8 21·8	0·3	0·2	6·3	3·7	12·3	7·3
04	8 46·0	8 47·4	8 22·0	0·4	0·2	6·4	3·8	12·4	7·3
05	8 46·3	8 47·7	8 22·3	0·5	0·3	6·5	3·8	12·5	7·4
06	8 46·5	8 47·9	8 22·5	0·6	0·4	6·6	3·9	12·6	7·5
07	8 46·8	8 48·2	8 22·8	0·7	0·4	6·7	4·0	12·7	7·5
08	8 47·0	8 48·4	8 23·0	0·8	0·5	6·8	4·0	12·8	7·6
09	8 47·3	8 48·7	8 23·2	0·9	0·5	6·9	4·1	12·9	7·6
10	8 47·5	8 48·9	8 23·5	1·0	0·6	7·0	4·1	13·0	7·7
11	8 47·8	8 49·2	8 23·7	1·1	0·7	7·1	4·2	13·1	7·8
12	8 48·0	8 49·4	8 23·9	1·2	0·7	7·2	4·3	13·2	7·8
13	8 48·3	8 49·7	8 24·2	1·3	0·8	7·3	4·3	13·3	7·9
14	8 48·5	8 49·9	8 24·4	1·4	0·8	7·4	4·4	13·4	7·9
15	8 48·8	8 50·2	8 24·7	1·5	0·9	7·5	4·4	13·5	8·0
16	8 49·0	8 50·4	8 24·9	1·6	0·9	7·6	4·5	13·6	8·0
17	8 49·3	8 50·7	8 25·1	1·7	1·0	7·7	4·6	13·7	8·1
18	8 49·5	8 50·9	8 25·4	1·8	1·1	7·8	4·6	13·8	8·2
19	8 49·8	8 51·2	8 25·6	1·9	1·1	7·9	4·7	13·9	8·2
20	8 50·0	8 51·5	8 25·9	2·0	1·2	8·0	4·7	14·0	8·3
21	8 50·3	8 51·7	8 26·1	2·1	1·2	8·1	4·8	14·1	8·3
22	8 50·5	8 52·0	8 26·3	2·2	1·3	8·2	4·9	14·2	8·4
23	8 50·8	8 52·2	8 26·6	2·3	1·4	8·3	4·9	14·3	8·5
24	8 51·0	8 52·5	8 26·8	2·4	1·4	8·4	5·0	14·4	8·5
25	8 51·3	8 52·7	8 27·0	2·5	1·5	8·5	5·0	14·5	8·6
26	8 51·5	8 53·0	8 27·3	2·6	1·5	8·6	5·1	14·6	8·6
27	8 51·8	8 53·2	8 27·5	2·7	1·6	8·7	5·1	14·7	8·7
28	8 52·0	8 53·5	8 27·8	2·8	1·7	8·8	5·2	14·8	8·8
29	8 52·3	8 53·7	8 28·0	2·9	1·7	8·9	5·3	14·9	8·8
30	8 52·5	8 54·0	8 28·2	3·0	1·8	9·0	5·3	15·0	8·9
31	8 52·8	8 54·2	8 28·5	3·1	1·8	9·1	5·4	15·1	8·9
32	8 53·0	8 54·5	8 28·7	3·2	1·9	9·2	5·4	15·2	9·0
33	8 53·3	8 54·7	8 29·0	3·3	2·0	9·3	5·5	15·3	9·1
34	8 53·5	8 55·0	8 29·2	3·4	2·0	9·4	5·6	15·4	9·1
35	8 53·8	8 55·2	8 29·4	3·5	2·1	9·5	5·6	15·5	9·2
36	8 54·0	8 55·5	8 29·7	3·6	2·1	9·6	5·7	15·6	9·2
37	8 54·3	8 55·7	8 29·9	3·7	2·2	9·7	5·7	15·7	9·3
38	8 54·5	8 56·0	8 30·2	3·8	2·2	9·8	5·8	15·8	9·3
39	8 54·8	8 56·2	8 30·4	3·9	2·3	9·9	5·9	15·9	9·4
40	8 55·0	8 56·5	8 30·6	4·0	2·4	10·0	5·9	16·0	9·5
41	8 55·3	8 56·7	8 30·9	4·1	2·4	10·1	6·0	16·1	9·5
42	8 55·5	8 57·0	8 31·1	4·2	2·5	10·2	6·0	16·2	9·6
43	8 55·8	8 57·2	8 31·3	4·3	2·5	10·3	6·1	16·3	9·6
44	8 56·0	8 57·5	8 31·6	4·4	2·6	10·4	6·2	16·4	9·7
45	8 56·3	8 57·7	8 31·8	4·5	2·7	10·5	6·2	16·5	9·8
46	8 56·5	8 58·0	8 32·1	4·6	2·7	10·6	6·3	16·6	9·8
47	8 56·8	8 58·2	8 32·3	4·7	2·8	10·7	6·3	16·7	9·9
48	8 57·0	8 58·5	8 32·5	4·8	2·8	10·8	6·4	16·8	9·9
49	8 57·3	8 58·7	8 32·8	4·9	2·9	10·9	6·4	16·9	10·0
50	8 57·5	8 59·0	8 33·0	5·0	3·0	11·0	6·5	17·0	10·1
51	8 57·8	8 59·2	8 33·3	5·1	3·0	11·1	6·6	17·1	10·1
52	8 58·0	8 59·5	8 33·5	5·2	3·1	11·2	6·6	17·2	10·2
53	8 58·3	8 59·7	8 33·7	5·3	3·1	11·3	6·7	17·3	10·2
54	8 58·5	9 00·0	8 34·0	5·4	3·2	11·4	6·7	17·4	10·3
55	8 58·8	9 00·2	8 34·2	5·5	3·3	11·5	6·8	17·5	10·4
56	8 59·0	9 00·5	8 34·4	5·6	3·3	11·6	6·9	17·6	10·4
57	8 59·3	9 00·7	8 34·7	5·7	3·4	11·7	6·9	17·7	10·5
58	8 59·5	9 01·0	8 34·9	5·8	3·4	11·8	7·0	17·8	10·5
59	8 59·8	9 01·2	8 35·2	5·9	3·5	11·9	7·0	17·9	10·6
60	9 00·0	9 01·5	8 35·4	6·0	3·6	12·0	7·1	18·0	10·7

40m	SOL PLANETAS	ARIES	LUNA	v o d	Corrn	v o d	Corrn	v o d	Corrn
s	° ′	° ′	° ′	′	′	′	′	′	′
00	10 00·0	10 01·6	9 32·7	0·0	0·0	6·0	4·1	12·0	8·1
01	10 00·3	10 01·9	9 32·9	0·1	0·1	6·1	4·1	12·1	8·2
02	10 00·5	10 02·1	9 33·1	0·2	0·1	6·2	4·2	12·2	8·2
03	10 00·8	10 02·4	9 33·4	0·3	0·2	6·3	4·3	12·3	8·3
04	10 01·0	10 02·6	9 33·6	0·4	0·3	6·4	4·3	12·4	8·4
05	10 01·3	10 02·9	9 33·9	0·5	0·3	6·5	4·4	12·5	8·4
06	10 01·5	10 03·1	9 34·1	0·6	0·4	6·6	4·5	12·6	8·5
07	10 01·8	10 03·4	9 34·3	0·7	0·5	6·7	4·5	12·7	8·6
08	10 02·0	10 03·6	9 34·6	0·8	0·5	6·8	4·6	12·8	8·6
09	10 02·3	10 03·9	9 34·8	0·9	0·6	6·9	4·7	12·9	8·7
10	10 02·5	10 04·1	9 35·1	1·0	0·7	7·0	4·7	13·0	8·8
11	10 02·8	10 04·4	9 35·3	1·1	0·7	7·1	4·8	13·1	8·8
12	10 03·0	10 04·7	9 35·5	1·2	0·8	7·2	4·9	13·2	8·9
13	10 03·3	10 04·9	9 35·8	1·3	0·9	7·3	4·9	13·3	9·0
14	10 03·5	10 05·2	9 36·0	1·4	0·9	7·4	5·0	13·4	9·0
15	10 03·8	10 05·4	9 36·2	1·5	1·0	7·5	5·1	13·5	9·1
16	10 04·0	10 05·7	9 36·5	1·6	1·1	7·6	5·1	13·6	9·2
17	10 04·3	10 05·9	9 36·7	1·7	1·1	7·7	5·2	13·7	9·2
18	10 04·5	10 06·2	9 37·0	1·8	1·2	7·8	5·3	13·8	9·3
19	10 04·8	10 06·4	9 37·2	1·9	1·3	7·9	5·3	13·9	9·4
20	10 05·0	10 06·7	9 37·4	2·0	1·4	8·0	5·4	14·0	9·5
21	10 05·3	10 06·9	9 37·7	2·1	1·4	8·1	5·5	14·1	9·5
22	10 05·5	10 07·2	9 37·9	2·2	1·5	8·2	5·5	14·2	9·6
23	10 05·8	10 07·4	9 38·2	2·3	1·6	8·3	5·6	14·3	9·7
24	10 06·0	10 07·7	9 38·4	2·4	1·6	8·4	5·7	14·4	9·7
25	10 06·3	10 07·9	9 38·6	2·5	1·7	8·5	5·7	14·5	9·8
26	10 06·5	10 08·2	9 38·9	2·6	1·8	8·6	5·8	14·6	9·9
27	10 06·8	10 08·4	9 39·1	2·7	1·8	8·7	5·9	14·7	9·9
28	10 07·0	10 08·7	9 39·3	2·8	1·9	8·8	5·9	14·8	10·0
29	10 07·3	10 08·9	9 39·6	2·9	2·0	8·9	6·0	14·9	10·1
30	10 07·5	10 09·2	9 39·8	3·0	2·0	9·0	6·1	15·0	10·1
31	10 07·8	10 09·4	9 40·1	3·1	2·1	9·1	6·1	15·1	10·2
32	10 08·0	10 09·7	9 40·3	3·2	2·2	9·2	6·2	15·2	10·3
33	10 08·3	10 09·9	9 40·5	3·3	2·2	9·3	6·3	15·3	10·3
34	10 08·5	10 10·2	9 40·8	3·4	2·3	9·4	6·3	15·4	10·4
35	10 08·8	10 10·4	9 41·0	3·5	2·4	9·5	6·4	15·5	10·5
36	10 09·0	10 10·7	9 41·3	3·6	2·4	9·6	6·5	15·6	10·5
37	10 09·3	10 10·9	9 41·5	3·7	2·5	9·7	6·5	15·7	10·6
38	10 09·5	10 11·2	9 41·7	3·8	2·6	9·8	6·6	15·8	10·7
39	10 09·8	10 11·4	9 42·0	3·9	2·6	9·9	6·7	15·9	10·7
40	10 10·0	10 11·7	9 42·2	4·0	2·7	10·0	6·8	16·0	10·8
41	10 10·3	10 11·9	9 42·4	4·1	2·8	10·1	6·8	16·1	10·9
42	10 10·5	10 12·2	9 42·7	4·2	2·8	10·2	6·9	16·2	10·9
43	10 10·8	10 12·4	9 42·9	4·3	2·9	10·3	7·0	16·3	11·0
44	10 11·0	10 12·7	9 43·2	4·4	3·0	10·4	7·0	16·4	11·1
45	10 11·3	10 12·9	9 43·4	4·5	3·0	10·5	7·1	16·5	11·1
46	10 11·5	10 13·2	9 43·6	4·6	3·1	10·6	7·2	16·6	11·2
47	10 11·8	10 13·4	9 43·9	4·7	3·2	10·7	7·2	16·7	11·3
48	10 12·0	10 13·7	9 44·1	4·8	3·2	10·8	7·3	16·8	11·3
49	10 12·3	10 13·9	9 44·4	4·9	3·3	10·9	7·4	16·9	11·4
50	10 12·5	10 14·2	9 44·6	5·0	3·4	11·0	7·4	17·0	11·5
51	10 12·8	10 14·4	9 44·8	5·1	3·4	11·1	7·5	17·1	11·5
52	10 13·0	10 14·7	9 45·1	5·2	3·5	11·2	7·6	17·2	11·6
53	10 13·3	10 14·9	9 45·3	5·3	3·6	11·3	7·6	17·3	11·7
54	10 13·5	10 15·2	9 45·6	5·4	3·6	11·4	7·7	17·4	11·7
55	10 13·8	10 15·4	9 45·8	5·5	3·7	11·5	7·8	17·5	11·8
56	10 14·0	10 15·7	9 46·0	5·6	3·8	11·6	7·8	17·6	11·9
57	10 14·3	10 15·9	9 46·3	5·7	3·8	11·7	7·9	17·7	11·9
58	10 14·5	10 16·2	9 46·5	5·8	3·9	11·8	8·0	17·8	12·0
59	10 14·8	10 16·4	9 46·7	5·9	4·0	11·9	8·0	17·9	12·1
60	10 15·0	10 16·7	9 47·0	6·0	4·1	12·0	8·1	18·0	12·2

41m	SOL PLANETAS	ARIES	LUNA	v o d	Corrn	v o d	Corrn	v o d	Corrn
s	° ′	° ′	° ′	′	′	′	′	′	′
00	10 15·0	10 16·7	9 47·0	0·0	0·0	6·0	4·2	12·0	8·3
01	10 15·3	10 16·9	9 47·2	0·1	0·1	6·1	4·2	12·1	8·4
02	10 15·5	10 17·2	9 47·5	0·2	0·1	6·2	4·3	12·2	8·4
03	10 15·8	10 17·4	9 47·7	0·3	0·2	6·3	4·4	12·3	8·5
04	10 16·0	10 17·7	9 47·9	0·4	0·3	6·4	4·4	12·4	8·6
05	10 16·3	10 17·9	9 48·2	0·5	0·3	6·5	4·5	12·5	8·6
06	10 16·5	10 18·2	9 48·4	0·6	0·4	6·6	4·6	12·6	8·7
07	10 16·8	10 18·4	9 48·7	0·7	0·5	6·7	4·6	12·7	8·8
08	10 17·0	10 18·7	9 48·9	0·8	0·6	6·8	4·7	12·8	8·9
09	10 17·3	10 18·9	9 49·1	0·9	0·6	6·9	4·8	12·9	8·9
10	10 17·5	10 19·2	9 49·4	1·0	0·7	7·0	4·8	13·0	9·0
11	10 17·8	10 19·4	9 49·6	1·1	0·8	7·1	4·9	13·1	9·1
12	10 18·0	10 19·7	9 49·8	1·2	0·8	7·2	5·0	13·2	9·1
13	10 18·3	10 19·9	9 50·1	1·3	0·9	7·3	5·0	13·3	9·2
14	10 18·5	10 20·2	9 50·3	1·4	1·0	7·4	5·1	13·4	9·3
15	10 18·8	10 20·4	9 50·6	1·5	1·0	7·5	5·2	13·5	9·3
16	10 19·0	10 20·7	9 50·8	1·6	1·1	7·6	5·3	13·6	9·4
17	10 19·3	10 20·9	9 51·0	1·7	1·2	7·7	5·3	13·7	9·5
18	10 19·5	10 21·2	9 51·3	1·8	1·2	7·8	5·4	13·8	9·5
19	10 19·8	10 21·4	9 51·5	1·9	1·3	7·9	5·5	13·9	9·6
20	10 20·0	10 21·7	9 51·8	2·0	1·4	8·0	5·5	14·0	9·7
21	10 20·3	10 21·9	9 52·0	2·1	1·5	8·1	5·6	14·1	9·8
22	10 20·5	10 22·2	9 52·2	2·2	1·5	8·2	5·7	14·2	9·8
23	10 20·8	10 22·4	9 52·5	2·3	1·6	8·3	5·7	14·3	9·9
24	10 21·0	10 22·7	9 52·7	2·4	1·7	8·4	5·8	14·4	10·0
25	10 21·3	10 23·0	9 52·9	2·5	1·7	8·5	5·9	14·5	10·0
26	10 21·5	10 23·2	9 53·2	2·6	1·8	8·6	5·9	14·6	10·1
27	10 21·8	10 23·5	9 53·4	2·7	1·9	8·7	6·0	14·7	10·2
28	10 22·0	10 23·7	9 53·7	2·8	1·9	8·8	6·1	14·8	10·2
29	10 22·3	10 24·0	9 53·9	2·9	2·0	8·9	6·2	14·9	10·3
30	10 22·5	10 24·2	9 54·1	3·0	2·1	9·0	6·2	15·0	10·4
31	10 22·8	10 24·5	9 54·4	3·1	2·1	9·1	6·3	15·1	10·4
32	10 23·0	10 24·7	9 54·6	3·2	2·2	9·2	6·4	15·2	10·5
33	10 23·3	10 25·0	9 54·9	3·3	2·3	9·3	6·4	15·3	10·6
34	10 23·5	10 25·2	9 55·1	3·4	2·4	9·4	6·5	15·4	10·7
35	10 23·8	10 25·5	9 55·3	3·5	2·4	9·5	6·6	15·5	10·7
36	10 24·0	10 25·7	9 55·6	3·6	2·5	9·6	6·6	15·6	10·8
37	10 24·3	10 26·0	9 55·8	3·7	2·6	9·7	6·7	15·7	10·9
38	10 24·5	10 26·2	9 56·1	3·8	2·6	9·8	6·8	15·8	10·9
39	10 24·8	10 26·5	9 56·3	3·9	2·7	9·9	6·8	15·9	11·0
40	10 25·0	10 26·7	9 56·5	4·0	2·8	10·0	6·9	16·0	11·1
41	10 25·3	10 27·0	9 56·8	4·1	2·8	10·1	7·0	16·1	11·1
42	10 25·5	10 27·2	9 57·0	4·2	2·9	10·2	7·1	16·2	11·2
43	10 25·8	10 27·5	9 57·2	4·3	3·0	10·3	7·1	16·3	11·3
44	10 26·0	10 27·7	9 57·5	4·4	3·0	10·4	7·2	16·4	11·3
45	10 26·3	10 28·0	9 57·7	4·5	3·1	10·5	7·3	16·5	11·4
46	10 26·5	10 28·2	9 58·0	4·6	3·2	10·6	7·3	16·6	11·5
47	10 26·8	10 28·5	9 58·2	4·7	3·3	10·7	7·4	16·7	11·6
48	10 27·0	10 28·7	9 58·4	4·8	3·3	10·8	7·5	16·8	11·6
49	10 27·3	10 29·0	9 58·7	4·9	3·4	10·9	7·5	16·9	11·7
50	10 27·5	10 29·2	9 58·9	5·0	3·5	11·0	7·6	17·0	11·8
51	10 27·8	10 29·5	9 59·2	5·1	3·5	11·1	7·7	17·1	11·8
52	10 28·0	10 29·7	9 59·4	5·2	3·6	11·2	7·7	17·2	11·9
53	10 28·3	10 30·0	9 59·6	5·3	3·7	11·3	7·8	17·3	12·0
54	10 28·5	10 30·2	9 59·9	5·4	3·7	11·4	7·9	17·4	12·0
55	10 28·8	10 30·5	10 00·1	5·5	3·8	11·5	8·0	17·5	12·1
56	10 29·0	10 30·7	10 00·3	5·6	3·9	11·6	8·0	17·6	12·2
57	10 29·3	10 31·0	10 00·6	5·7	3·9	11·7	8·1	17·7	12·2
58	10 29·5	10 31·2	10 00·8	5·8	4·0	11·8	8·2	17·8	12·3
59	10 29·8	10 31·5	10 01·1	5·9	4·1	11·9	8·2	17·9	12·4
60	10 30·0	10 31·7	10 01·3	6·0	4·2	12·0	8·3	18·0	12·5

42m	SOL PLANETAS	ARIES	LUNA	v o d	Corrn	v o d	Corrn	v o d	Corrn
s	° ′	° ′	° ′	′	′	′	′	′	′
00	10 30·0	10 31·7	10 01·3	0·0	0·0	6·0	4·3	12·0	8·5
01	10 30·3	10 32·0	10 01·5	0·1	0·1	6·1	4·3	12·1	8·6
02	10 30·5	10 32·2	10 01·8	0·2	0·1	6·2	4·4	12·2	8·6
03	10 30·8	10 32·5	10 02·0	0·3	0·2	6·3	4·5	12·3	8·7
04	10 31·0	10 32·7	10 02·3	0·4	0·3	6·4	4·5	12·4	8·8
05	10 31·3	10 33·0	10 02·5	0·5	0·4	6·5	4·6	12·5	8·9
06	10 31·5	10 33·2	10 02·7	0·6	0·4	6·6	4·7	12·6	8·9
07	10 31·8	10 33·5	10 03·0	0·7	0·5	6·7	4·7	12·7	9·0
08	10 32·0	10 33·7	10 03·2	0·8	0·6	6·8	4·8	12·8	9·1
09	10 32·3	10 34·0	10 03·4	0·9	0·6	6·9	4·9	12·9	9·1
10	10 32·5	10 34·2	10 03·7	1·0	0·7	7·0	5·0	13·0	9·2
11	10 32·8	10 34·5	10 03·9	1·1	0·8	7·1	5·0	13·1	9·3
12	10 33·0	10 34·7	10 04·2	1·2	0·9	7·2	5·1	13·2	9·4
13	10 33·3	10 35·0	10 04·4	1·3	0·9	7·3	5·2	13·3	9·4
14	10 33·5	10 35·2	10 04·6	1·4	1·0	7·4	5·2	13·4	9·5
15	10 33·8	10 35·5	10 04·9	1·5	1·1	7·5	5·3	13·5	9·6
16	10 34·0	10 35·7	10 05·1	1·6	1·1	7·6	5·4	13·6	9·6
17	10 34·3	10 36·0	10 05·4	1·7	1·2	7·7	5·5	13·7	9·7
18	10 34·5	10 36·2	10 05·6	1·8	1·3	7·8	5·5	13·8	9·8
19	10 34·8	10 36·5	10 05·8	1·9	1·3	7·9	5·6	13·9	9·8
20	10 35·0	10 36·7	10 06·1	2·0	1·4	8·0	5·7	14·0	9·9
21	10 35·3	10 37·0	10 06·3	2·1	1·5	8·1	5·7	14·1	10·0
22	10 35·5	10 37·2	10 06·5	2·2	1·6	8·2	5·8	14·2	10·1
23	10 35·8	10 37·5	10 06·8	2·3	1·6	8·3	5·9	14·3	10·1
24	10 36·0	10 37·7	10 07·0	2·4	1·7	8·4	6·0	14·4	10·2
25	10 36·3	10 38·0	10 07·3	2·5	1·8	8·5	6·0	14·5	10·3
26	10 36·5	10 38·2	10 07·5	2·6	1·8	8·6	6·1	14·6	10·3
27	10 36·8	10 38·5	10 07·7	2·7	1·9	8·7	6·2	14·7	10·4
28	10 37·0	10 38·7	10 08·0	2·8	2·0	8·8	6·2	14·8	10·5
29	10 37·3	10 39·0	10 08·2	2·9	2·1	8·9	6·3	14·9	10·6
30	10 37·5	10 39·2	10 08·5	3·0	2·1	9·0	6·4	15·0	10·6
31	10 37·8	10 39·5	10 08·7	3·1	2·2	9·1	6·4	15·1	10·7
32	10 38·0	10 39·7	10 08·9	3·2	2·3	9·2	6·5	15·2	10·8
33	10 38·3	10 40·0	10 09·2	3·3	2·3	9·3	6·6	15·3	10·8
34	10 38·5	10 40·2	10 09·4	3·4	2·4	9·4	6·7	15·4	10·9
35	10 38·8	10 40·5	10 09·7	3·5	2·5	9·5	6·7	15·5	11·0
36	10 39·0	10 40·7	10 09·9	3·6	2·6	9·6	6·8	15·6	11·1
37	10 39·3	10 41·0	10 10·1	3·7	2·6	9·7	6·9	15·7	11·1
38	10 39·5	10 41·3	10 10·4	3·8	2·7	9·8	6·9	15·8	11·2
39	10 39·8	10 41·5	10 10·6	3·9	2·8	9·9	7·0	15·9	11·3
40	10 40·0	10 41·8	10 10·8	4·0	2·8	10·0	7·1	16·0	11·3
41	10 40·3	10 42·0	10 11·1	4·1	2·9	10·1	7·2	16·1	11·4
42	10 40·5	10 42·3	10 11·3	4·2	3·0	10·2	7·2	16·2	11·5
43	10 40·8	10 42·5	10 11·6	4·3	3·0	10·3	7·3	16·3	11·5
44	10 41·0	10 42·8	10 11·8	4·4	3·1	10·4	7·4	16·4	11·6
45	10 41·3	10 43·0	10 12·0	4·5	3·2	10·5	7·4	16·5	11·7
46	10 41·5	10 43·3	10 12·3	4·6	3·3	10·6	7·5	16·6	11·8
47	10 41·8	10 43·5	10 12·5	4·7	3·3	10·7	7·6	16·7	11·8
48	10 42·0	10 43·8	10 12·8	4·8	3·4	10·8	7·7	16·8	11·9
49	10 42·3	10 44·0	10 13·0	4·9	3·5	10·9	7·7	16·9	12·0
50	10 42·5	10 44·3	10 13·2	5·0	3·5	11·0	7·8	17·0	12·0
51	10 42·8	10 44·5	10 13·5	5·1	3·6	11·1	7·9	17·1	12·1
52	10 43·0	10 44·8	10 13·7	5·2	3·7	11·2	7·9	17·2	12·2
53	10 43·3	10 45·0	10 13·9	5·3	3·8	11·3	8·0	17·3	12·3
54	10 43·5	10 45·3	10 14·2	5·4	3·8	11·4	8·1	17·4	12·3
55	10 43·8	10 45·5	10 14·4	5·5	3·9	11·5	8·1	17·5	12·4
56	10 44·0	10 45·8	10 14·7	5·6	4·0	11·6	8·2	17·6	12·5
57	10 44·3	10 46·0	10 14·9	5·7	4·0	11·7	8·3	17·7	12·5
58	10 44·5	10 46·3	10 15·1	5·8	4·1	11·8	8·4	17·8	12·6
59	10 44·8	10 46·5	10 15·4	5·9	4·2	11·9	8·4	17·9	12·7
60	10 45·0	10 46·8	10 15·6	6·0	4·3	12·0	8·5	18·0	12·8

43m	SOL PLANETAS	ARIES	LUNA	v o d	Corrn	v o d	Corrn	v o d	Corrn
s	° ′	° ′	° ′	′	′	′	′	′	′
00	10 45·0	10 46·8	10 15·6	0·0	0·0	6·0	4·4	12·0	8·7
01	10 45·3	10 47·0	10 15·9	0·1	0·1	6·1	4·4	12·1	8·8
02	10 45·5	10 47·3	10 16·1	0·2	0·1	6·2	4·5	12·2	8·8
03	10 45·8	10 47·5	10 16·3	0·3	0·2	6·3	4·6	12·3	8·9
04	10 46·0	10 47·8	10 16·6	0·4	0·3	6·4	4·6	12·4	9·0
05	10 46·3	10 48·0	10 16·8	0·5	0·4	6·5	4·7	12·5	9·1
06	10 46·5	10 48·3	10 17·0	0·6	0·4	6·6	4·8	12·6	9·1
07	10 46·8	10 48·5	10 17·3	0·7	0·5	6·7	4·9	12·7	9·2
08	10 47·0	10 48·8	10 17·5	0·8	0·6	6·8	4·9	12·8	9·3
09	10 47·3	10 49·0	10 17·8	0·9	0·7	6·9	5·0	12·9	9·4
10	10 47·5	10 49·3	10 18·0	1·0	0·7	7·0	5·1	13·0	9·4
11	10 47·8	10 49·5	10 18·2	1·1	0·8	7·1	5·1	13·1	9·5
12	10 48·0	10 49·8	10 18·5	1·2	0·9	7·2	5·2	13·2	9·6
13	10 48·3	10 50·0	10 18·7	1·3	0·9	7·3	5·3	13·3	9·6
14	10 48·5	10 50·3	10 19·0	1·4	1·0	7·4	5·4	13·4	9·7
15	10 48·8	10 50·5	10 19·2	1·5	1·1	7·5	5·4	13·5	9·8
16	10 49·0	10 50·8	10 19·4	1·6	1·2	7·6	5·5	13·6	9·9
17	10 49·3	10 51·0	10 19·7	1·7	1·2	7·7	5·6	13·7	9·9
18	10 49·5	10 51·3	10 19·9	1·8	1·3	7·8	5·7	13·8	10·0
19	10 49·8	10 51·5	10 20·2	1·9	1·4	7·9	5·7	13·9	10·1
20	10 50·0	10 51·8	10 20·4	2·0	1·5	8·0	5·8	14·0	10·2
21	10 50·3	10 52·0	10 20·6	2·1	1·5	8·1	5·9	14·1	10·2
22	10 50·5	10 52·3	10 20·9	2·2	1·6	8·2	5·9	14·2	10·3
23	10 50·8	10 52·5	10 21·1	2·3	1·7	8·3	6·0	14·3	10·4
24	10 51·0	10 52·8	10 21·3	2·4	1·7	8·4	6·1	14·4	10·4
25	10 51·3	10 53·0	10 21·6	2·5	1·8	8·5	6·2	14·5	10·5
26	10 51·5	10 53·3	10 21·8	2·6	1·9	8·6	6·2	14·6	10·6
27	10 51·8	10 53·5	10 22·1	2·7	2·0	8·7	6·3	14·7	10·7
28	10 52·0	10 53·8	10 22·3	2·8	2·0	8·8	6·4	14·8	10·7
29	10 52·3	10 54·0	10 22·5	2·9	2·1	8·9	6·5	14·9	10·8
30	10 52·5	10 54·3	10 22·8	3·0	2·2	9·0	6·5	15·0	10·9
31	10 52·8	10 54·5	10 23·0	3·1	2·2	9·1	6·6	15·1	10·9
32	10 53·0	10 54·8	10 23·3	3·2	2·3	9·2	6·7	15·2	11·0
33	10 53·3	10 55·0	10 23·5	3·3	2·4	9·3	6·7	15·3	11·1
34	10 53·5	10 55·3	10 23·7	3·4	2·5	9·4	6·8	15·4	11·2
35	10 53·8	10 55·5	10 24·0	3·5	2·5	9·5	6·9	15·5	11·2
36	10 54·0	10 55·8	10 24·2	3·6	2·6	9·6	7·0	15·6	11·3
37	10 54·3	10 56·0	10 24·4	3·7	2·7	9·7	7·0	15·7	11·4
38	10 54·5	10 56·3	10 24·7	3·8	2·8	9·8	7·1	15·8	11·5
39	10 54·8	10 56·5	10 24·9	3·9	2·8	9·9	7·2	15·9	11·5
40	10 55·0	10 56·8	10 25·2	4·0	2·9	10·0	7·3	16·0	11·6
41	10 55·3	10 57·0	10 25·4	4·1	3·0	10·1	7·3	16·1	11·7
42	10 55·5	10 57·3	10 25·6	4·2	3·0	10·2	7·4	16·2	11·7
43	10 55·8	10 57·5	10 25·9	4·3	3·1	10·3	7·5	16·3	11·8
44	10 56·0	10 57·8	10 26·1	4·4	3·2	10·4	7·5	16·4	11·9
45	10 56·3	10 58·0	10 26·4	4·5	3·3	10·5	7·6	16·5	12·0
46	10 56·5	10 58·3	10 26·6	4·6	3·3	10·6	7·7	16·6	12·0
47	10 56·8	10 58·5	10 26·8	4·7	3·4	10·7	7·8	16·7	12·1
48	10 57·0	10 58·8	10 27·1	4·8	3·5	10·8	7·8	16·8	12·2
49	10 57·3	10 59·0	10 27·3	4·9	3·6	10·9	7·9	16·9	12·3
50	10 57·5	10 59·3	10 27·5	5·0	3·6	11·0	8·0	17·0	12·3
51	10 57·8	10 59·6	10 27·8	5·1	3·7	11·1	8·0	17·1	12·4
52	10 58·0	10 59·8	10 28·0	5·2	3·8	11·2	8·1	17·2	12·5
53	10 58·3	11 00·1	10 28·3	5·3	3·8	11·3	8·2	17·3	12·5
54	10 58·5	11 00·3	10 28·5	5·4	3·9	11·4	8·3	17·4	12·6
55	10 58·8	11 00·6	10 28·7	5·5	4·0	11·5	8·3	17·5	12·7
56	10 59·0	11 00·8	10 29·0	5·6	4·1	11·6	8·4	17·6	12·8
57	10 59·3	11 01·1	10 29·2	5·7	4·1	11·7	8·5	17·7	12·8
58	10 59·5	11 01·3	10 29·5	5·8	4·2	11·8	8·6	17·8	12·9
59	10 59·8	11 01·6	10 29·7	5·9	4·3	11·9	8·6	17·9	13·0
60	11 00·0	11 01·8	10 29·9	6·0	4·4	12·0	8·7	18·0	13·1

44m	SOL PLANETAS	ARIES	LUNA	v o d	Corrn	v o d	Corrn	v o d	Corrn
s	° ′	° ′	° ′	′	′	′	′	′	′
00	11 00·0	11 01·8	10 29·9	0·0	0·0	6·0	4·5	12·0	8·9
01	11 00·3	11 02·1	10 30·2	0·1	0·1	6·1	4·5	12·1	9·0
02	11 00·5	11 02·3	10 30·4	0·2	0·1	6·2	4·6	12·2	9·0
03	11 00·8	11 02·6	10 30·6	0·3	0·2	6·3	4·7	12·3	9·1
04	11 01·0	11 02·8	10 30·9	0·4	0·3	6·4	4·7	12·4	9·2
05	11 01·3	11 03·1	10 31·1	0·5	0·4	6·5	4·8	12·5	9·3
06	11 01·5	11 03·3	10 31·4	0·6	0·4	6·6	4·9	12·6	9·3
07	11 01·8	11 03·6	10 31·6	0·7	0·5	6·7	5·0	12·7	9·4
08	11 02·0	11 03·8	10 31·8	0·8	0·6	6·8	5·0	12·8	9·5
09	11 02·3	11 04·1	10 32·1	0·9	0·7	6·9	5·1	12·9	9·6
10	11 02·5	11 04·3	10 32·3	1·0	0·7	7·0	5·2	13·0	9·6
11	11 02·8	11 04·6	10 32·6	1·1	0·8	7·1	5·3	13·1	9·7
12	11 03·0	11 04·8	10 32·8	1·2	0·9	7·2	5·3	13·2	9·8
13	11 03·3	11 05·1	10 33·0	1·3	1·0	7·3	5·4	13·3	9·9
14	11 03·5	11 05·3	10 33·3	1·4	1·0	7·4	5·5	13·4	9·9
15	11 03·8	11 05·6	10 33·5	1·5	1·1	7·5	5·6	13·5	10·0
16	11 04·0	11 05·8	10 33·8	1·6	1·2	7·6	5·6	13·6	10·1
17	11 04·3	11 06·1	10 34·0	1·7	1·3	7·7	5·7	13·7	10·2
18	11 04·5	11 06·3	10 34·2	1·8	1·3	7·8	5·8	13·8	10·2
19	11 04·8	11 06·6	10 34·5	1·9	1·4	7·9	5·9	13·9	10·3
20	11 05·0	11 06·8	10 34·7	2·0	1·5	8·0	5·9	14·0	10·4
21	11 05·3	11 07·1	10 34·9	2·1	1·6	8·1	6·0	14·1	10·5
22	11 05·5	11 07·3	10 35·2	2·2	1·6	8·2	6·1	14·2	10·5
23	11 05·8	11 07·6	10 35·4	2·3	1·7	8·3	6·2	14·3	10·6
24	11 06·0	11 07·8	10 35·7	2·4	1·8	8·4	6·2	14·4	10·7
25	11 06·3	11 08·1	10 35·9	2·5	1·9	8·5	6·3	14·5	10·8
26	11 06·5	11 08·3	10 36·1	2·6	1·9	8·6	6·4	14·6	10·8
27	11 06·8	11 08·6	10 36·4	2·7	2·0	8·7	6·5	14·7	10·9
28	11 07·0	11 08·8	10 36·6	2·8	2·1	8·8	6·5	14·8	11·0
29	11 07·3	11 09·1	10 36·9	2·9	2·2	8·9	6·6	14·9	11·1
30	11 07·5	11 09·3	10 37·1	3·0	2·2	9·0	6·7	15·0	11·1
31	11 07·8	11 09·6	10 37·3	3·1	2·3	9·1	6·7	15·1	11·2
32	11 08·0	11 09·8	10 37·6	3·2	2·4	9·2	6·8	15·2	11·3
33	11 08·3	11 10·1	10 37·8	3·3	2·4	9·3	6·9	15·3	11·3
34	11 08·5	11 10·3	10 38·0	3·4	2·5	9·4	7·0	15·4	11·4
35	11 08·8	11 10·6	10 38·3	3·5	2·6	9·5	7·0	15·5	11·5
36	11 09·0	11 10·8	10 38·5	3·6	2·7	9·6	7·1	15·6	11·6
37	11 09·3	11 11·1	10 38·8	3·7	2·7	9·7	7·2	15·7	11·6
38	11 09·5	11 11·3	10 39·0	3·8	2·8	9·8	7·3	15·8	11·7
39	11 09·8	11 11·6	10 39·2	3·9	2·9	9·9	7·3	15·9	11·8
40	11 10·0	11 11·8	10 39·5	4·0	3·0	10·0	7·4	16·0	11·9
41	11 10·3	11 12·1	10 39·7	4·1	3·0	10·1	7·5	16·1	11·9
42	11 10·5	11 12·3	10 40·0	4·2	3·1	10·2	7·6	16·2	12·0
43	11 10·8	11 12·6	10 40·2	4·3	3·2	10·3	7·6	16·3	12·1
44	11 11·0	11 12·8	10 40·4	4·4	3·3	10·4	7·7	16·4	12·2
45	11 11·3	11 13·1	10 40·7	4·5	3·3	10·5	7·8	16·5	12·2
46	11 11·5	11 13·3	10 40·9	4·6	3·4	10·6	7·9	16·6	12·3
47	11 11·8	11 13·6	10 41·1	4·7	3·5	10·7	7·9	16·7	12·4
48	11 12·0	11 13·8	10 41·4	4·8	3·6	10·8	8·0	16·8	12·5
49	11 12·3	11 14·1	10 41·6	4·9	3·6	10·9	8·1	16·9	12·5
50	11 12·5	11 14·3	10 41·9	5·0	3·7	11·0	8·2	17·0	12·6
51	11 12·8	11 14·6	10 42·1	5·1	3·8	11·1	8·2	17·1	12·7
52	11 13·0	11 14·8	10 42·3	5·2	3·9	11·2	8·3	17·2	12·8
53	11 13·3	11 15·1	10 42·6	5·3	3·9	11·3	8·4	17·3	12·8
54	11 13·5	11 15·3	10 42·8	5·4	4·0	11·4	8·5	17·4	12·9
55	11 13·8	11 15·6	10 43·1	5·5	4·1	11·5	8·5	17·5	13·0
56	11 14·0	11 15·8	10 43·3	5·6	4·2	11·6	8·6	17·6	13·1
57	11 14·3	11 16·1	10 43·5	5·7	4·2	11·7	8·7	17·7	13·1
58	11 14·5	11 16·3	10 43·8	5·8	4·3	11·8	8·8	17·8	13·2
59	11 14·8	11 16·6	10 44·0	5·9	4·4	11·9	8·8	17·9	13·3
60	11 15·0	11 16·8	10 44·3	6·0	4·5	12·0	8·9	18·0	13·4

45m	SOL PLANETAS	ARIES	LUNA	v o d	Corrn	v o d	Corrn	v o d	Corrn
s	° ′	° ′	° ′	′	′	′	′	′	′
00	11 15·0	11 16·8	10 44·3	0·0	0·0	6·0	4·6	12·0	9·1
01	11 15·3	11 17·1	10 44·5	0·1	0·1	6·1	4·6	12·1	9·2
02	11 15·5	11 17·3	10 44·7	0·2	0·2	6·2	4·7	12·2	9·3
03	11 15·8	11 17·6	10 45·0	0·3	0·2	6·3	4·8	12·3	9·3
04	11 16·0	11 17·9	10 45·2	0·4	0·3	6·4	4·9	12·4	9·4
05	11 16·3	11 18·1	10 45·4	0·5	0·4	6·5	4·9	12·5	9·5
06	11 16·5	11 18·4	10 45·7	0·6	0·5	6·6	5·0	12·6	9·6
07	11 16·8	11 18·6	10 45·9	0·7	0·5	6·7	5·1	12·7	9·6
08	11 17·0	11 18·9	10 46·2	0·8	0·6	6·8	5·2	12·8	9·7
09	11 17·3	11 19·1	10 46·4	0·9	0·7	6·9	5·2	12·9	9·8
10	11 17·5	11 19·4	10 46·6	1·0	0·8	7·0	5·3	13·0	9·9
11	11 17·8	11 19·6	10 46·9	1·1	0·8	7·1	5·4	13·1	9·9
12	11 18·0	11 19·9	10 47·1	1·2	0·9	7·2	5·5	13·2	10·0
13	11 18·3	11 20·1	10 47·4	1·3	1·0	7·3	5·5	13·3	10·1
14	11 18·5	11 20·4	10 47·6	1·4	1·1	7·4	5·6	13·4	10·2
15	11 18·8	11 20·6	10 47·8	1·5	1·1	7·5	5·7	13·5	10·2
16	11 19·0	11 20·9	10 48·1	1·6	1·2	7·6	5·8	13·6	10·3
17	11 19·3	11 21·1	10 48·3	1·7	1·3	7·7	5·8	13·7	10·4
18	11 19·5	11 21·4	10 48·5	1·8	1·4	7·8	5·9	13·8	10·5
19	11 19·8	11 21·6	10 48·8	1·9	1·4	7·9	6·0	13·9	10·5
20	11 20·0	11 21·9	10 49·0	2·0	1·5	8·0	6·1	14·0	10·6
21	11 20·3	11 22·1	10 49·3	2·1	1·6	8·1	6·1	14·1	10·7
22	11 20·5	11 22·4	10 49·5	2·2	1·7	8·2	6·2	14·2	10·8
23	11 20·8	11 22·6	10 49·7	2·3	1·7	8·3	6·3	14·3	10·8
24	11 21·0	11 22·9	10 50·0	2·4	1·8	8·4	6·4	14·4	10·9
25	11 21·3	11 23·1	10 50·2	2·5	1·9	8·5	6·4	14·5	11·0
26	11 21·5	11 23·4	10 50·5	2·6	2·0	8·6	6·5	14·6	11·1
27	11 21·8	11 23·6	10 50·7	2·7	2·0	8·7	6·6	14·7	11·1
28	11 22·0	11 23·9	10 50·9	2·8	2·1	8·8	6·7	14·8	11·2
29	11 22·3	11 24·1	10 51·2	2·9	2·2	8·9	6·7	14·9	11·3
30	11 22·5	11 24·4	10 51·4	3·0	2·3	9·0	6·8	15·0	11·4
31	11 22·8	11 24·6	10 51·6	3·1	2·4	9·1	6·9	15·1	11·5
32	11 23·0	11 24·9	10 51·9	3·2	2·4	9·2	7·0	15·2	11·5
33	11 23·3	11 25·1	10 52·1	3·3	2·5	9·3	7·1	15·3	11·6
34	11 23·5	11 25·4	10 52·4	3·4	2·6	9·4	7·1	15·4	11·7
35	11 23·8	11 25·6	10 52·6	3·5	2·7	9·5	7·2	15·5	11·8
36	11 24·0	11 25·9	10 52·8	3·6	2·7	9·6	7·3	15·6	11·8
37	11 24·3	11 26·1	10 53·1	3·7	2·8	9·7	7·4	15·7	11·9
38	11 24·5	11 26·4	10 53·3	3·8	2·9	9·8	7·4	15·8	12·0
39	11 24·8	11 26·6	10 53·6	3·9	3·0	9·9	7·5	15·9	12·1
40	11 25·0	11 26·9	10 53·8	4·0	3·0	10·0	7·6	16·0	12·1
41	11 25·3	11 27·1	10 54·0	4·1	3·1	10·1	7·7	16·1	12·2
42	11 25·5	11 27·4	10 54·3	4·2	3·2	10·2	7·7	16·2	12·3
43	11 25·8	11 27·6	10 54·5	4·3	3·3	10·3	7·8	16·3	12·4
44	11 26·0	11 27·9	10 54·7	4·4	3·3	10·4	7·9	16·4	12·4
45	11 26·3	11 28·1	10 55·0	4·5	3·4	10·5	8·0	16·5	12·5
46	11 26·5	11 28·4	10 55·2	4·6	3·5	10·6	8·0	16·6	12·6
47	11 26·8	11 28·6	10 55·5	4·7	3·6	10·7	8·1	16·7	12·7
48	11 27·0	11 28·9	10 55·7	4·8	3·6	10·8	8·2	16·8	12·7
49	11 27·3	11 29·1	10 55·9	4·9	3·7	10·9	8·3	16·9	12·8
50	11 27·5	11 29·4	10 56·2	5·0	3·8	11·0	8·3	17·0	12·9
51	11 27·8	11 29·6	10 56·4	5·1	3·9	11·1	8·4	17·1	13·0
52	11 28·0	11 29·9	10 56·7	5·2	3·9	11·2	8·5	17·2	13·0
53	11 28·3	11 30·1	10 56·9	5·3	4·0	11·3	8·6	17·3	13·1
54	11 28·5	11 30·4	10 57·1	5·4	4·1	11·4	8·6	17·4	13·2
55	11 28·8	11 30·6	10 57·4	5·5	4·2	11·5	8·7	17·5	13·3
56	11 29·0	11 30·9	10 57·6	5·6	4·2	11·6	8·8	17·6	13·3
57	11 29·3	11 31·1	10 57·9	5·7	4·3	11·7	8·9	17·7	13·4
58	11 29·5	11 31·4	10 58·1	5·8	4·4	11·8	8·9	17·8	13·5
59	11 29·8	11 31·6	10 58·3	5·9	4·5	11·9	9·0	17·9	13·6
60	11 30·0	11 31·9	10 58·6	6·0	4·6	12·0	9·1	18·0	13·7

46m	SOL PLANETAS	ARIES	LUNA	v o d	Corrn	v o d	Corrn	v o d	Corrn
s	° ′	° ′	° ′	′	′	′	′	′	′
00	11 30·0	11 31·9	10 58·6	0·0	0·0	6·0	4·7	12·0	9·3
01	11 30·3	11 32·1	10 58·8	0·1	0·1	6·1	4·7	12·1	9·4
02	11 30·5	11 32·4	10 59·0	0·2	0·2	6·2	4·8	12·2	9·5
03	11 30·8	11 32·6	10 59·3	0·3	0·2	6·3	4·9	12·3	9·5
04	11 31·0	11 32·9	10 59·5	0·4	0·3	6·4	5·0	12·4	9·6
05	11 31·3	11 33·1	10 59·8	0·5	0·4	6·5	5·0	12·5	9·7
06	11 31·5	11 33·4	11 00·0	0·6	0·5	6·6	5·1	12·6	9·8
07	11 31·8	11 33·6	11 00·2	0·7	0·5	6·7	5·2	12·7	9·8
08	11 32·0	11 33·9	11 00·5	0·8	0·6	6·8	5·3	12·8	9·9
09	11 32·3	11 34·1	11 00·7	0·9	0·7	6·9	5·3	12·9	10·0
10	11 32·5	11 34·4	11 01·0	1·0	0·8	7·0	5·4	13·0	10·1
11	11 32·8	11 34·6	11 01·2	1·1	0·9	7·1	5·5	13·1	10·2
12	11 33·0	11 34·9	11 01·4	1·2	0·9	7·2	5·6	13·2	10·2
13	11 33·3	11 35·1	11 01·7	1·3	1·0	7·3	5·7	13·3	10·3
14	11 33·5	11 35·4	11 01·9	1·4	1·1	7·4	5·7	13·4	10·4
15	11 33·8	11 35·6	11 02·1	1·5	1·2	7·5	5·8	13·5	10·5
16	11 34·0	11 35·9	11 02·4	1·6	1·2	7·6	5·9	13·6	10·5
17	11 34·3	11 36·2	11 02·6	1·7	1·3	7·7	6·0	13·7	10·6
18	11 34·5	11 36·4	11 02·9	1·8	1·4	7·8	6·0	13·8	10·7
19	11 34·8	11 36·7	11 03·1	1·9	1·5	7·9	6·1	13·9	10·8
20	11 35·0	11 36·9	11 03·3	2·0	1·6	8·0	6·2	14·0	10·9
21	11 35·3	11 37·2	11 03·6	2·1	1·6	8·1	6·3	14·1	10·9
22	11 35·5	11 37·4	11 03·8	2·2	1·7	8·2	6·4	14·2	11·0
23	11 35·8	11 37·7	11 04·1	2·3	1·8	8·3	6·4	14·3	11·1
24	11 36·0	11 37·9	11 04·3	2·4	1·9	8·4	6·5	14·4	11·2
25	11 36·3	11 38·2	11 04·5	2·5	1·9	8·5	6·6	14·5	11·2
26	11 36·5	11 38·4	11 04·8	2·6	2·0	8·6	6·7	14·6	11·3
27	11 36·8	11 38·7	11 05·0	2·7	2·1	8·7	6·7	14·7	11·4
28	11 37·0	11 38·9	11 05·2	2·8	2·2	8·8	6·8	14·8	11·5
29	11 37·3	11 39·2	11 05·5	2·9	2·2	8·9	6·9	14·9	11·5
30	11 37·5	11 39·4	11 05·7	3·0	2·3	9·0	7·0	15·0	11·6
31	11 37·8	11 39·7	11 06·0	3·1	2·4	9·1	7·1	15·1	11·7
32	11 38·0	11 39·9	11 06·2	3·2	2·5	9·2	7·1	15·2	11·8
33	11 38·3	11 40·2	11 06·4	3·3	2·6	9·3	7·2	15·3	11·9
34	11 38·5	11 40·4	11 06·7	3·4	2·6	9·4	7·3	15·4	11·9
35	11 38·8	11 40·7	11 06·9	3·5	2·7	9·5	7·4	15·5	12·0
36	11 39·0	11 40·9	11 07·2	3·6	2·8	9·6	7·4	15·6	12·1
37	11 39·3	11 41·2	11 07·4	3·7	2·9	9·7	7·5	15·7	12·2
38	11 39·5	11 41·4	11 07·6	3·8	2·9	9·8	7·6	15·8	12·2
39	11 39·8	11 41·7	11 07·9	3·9	3·0	9·9	7·7	15·9	12·3
40	11 40·0	11 41·9	11 08·1	4·0	3·1	10·0	7·8	16·0	12·4
41	11 40·3	11 42·2	11 08·3	4·1	3·2	10·1	7·8	16·1	12·5
42	11 40·5	11 42·4	11 08·6	4·2	3·3	10·2	7·9	16·2	12·6
43	11 40·8	11 42·7	11 08·8	4·3	3·3	10·3	8·0	16·3	12·6
44	11 41·0	11 42·9	11 09·1	4·4	3·4	10·4	8·1	16·4	12·7
45	11 41·3	11 43·2	11 09·3	4·5	3·5	10·5	8·1	16·5	12·8
46	11 41·5	11 43·4	11 09·5	4·6	3·6	10·6	8·2	16·6	12·9
47	11 41·8	11 43·7	11 09·8	4·7	3·6	10·7	8·3	16·7	12·9
48	11 42·0	11 43·9	11 10·0	4·8	3·7	10·8	8·4	16·8	13·0
49	11 42·3	11 44·2	11 10·3	4·9	3·8	10·9	8·4	16·9	13·1
50	11 42·5	11 44·4	11 10·5	5·0	3·9	11·0	8·5	17·0	13·2
51	11 42·8	11 44·7	11 10·7	5·1	4·0	11·1	8·6	17·1	13·3
52	11 43·0	11 44·9	11 11·0	5·2	4·0	11·2	8·7	17·2	13·3
53	11 43·3	11 45·2	11 11·2	5·3	4·1	11·3	8·8	17·3	13·4
54	11 43·5	11 45·4	11 11·5	5·4	4·2	11·4	8·8	17·4	13·5
55	11 43·8	11 45·7	11 11·7	5·5	4·3	11·5	8·9	17·5	13·6
56	11 44·0	11 45·9	11 11·9	5·6	4·3	11·6	9·0	17·6	13·6
57	11 44·3	11 46·2	11 12·2	5·7	4·4	11·7	9·1	17·7	13·7
58	11 44·5	11 46·4	11 12·4	5·8	4·5	11·8	9·1	17·8	13·8
59	11 44·8	11 46·7	11 12·6	5·9	4·6	11·9	9·2	17·9	13·9
60	11 45·0	11 46·9	11 12·9	6·0	4·7	12·0	9·3	18·0	14·0

47m	SOL PLANETAS	ARIES	LUNA	v o d	Corrn	v o d	Corrn	v o d	Corrn
s	° ′	° ′	° ′	′	′	′	′	′	′
00	11 45·0	11 46·9	11 12·9	0·0	0·0	6·0	4·8	12·0	9·5
01	11 45·3	11 47·2	11 13·1	0·1	0·1	6·1	4·8	12·1	9·6
02	11 45·5	11 47·4	11 13·4	0·2	0·2	6·2	4·9	12·2	9·7
03	11 45·8	11 47·7	11 13·6	0·3	0·2	6·3	5·0	12·3	9·7
04	11 46·0	11 47·9	11 13·8	0·4	0·3	6·4	5·1	12·4	9·8
05	11 46·3	11 48·2	11 14·1	0·5	0·4	6·5	5·1	12·5	9·9
06	11 46·5	11 48·4	11 14·3	0·6	0·5	6·6	5·2	12·6	10·0
07	11 46·8	11 48·7	11 14·6	0·7	0·6	6·7	5·3	12·7	10·1
08	11 47·0	11 48·9	11 14·8	0·8	0·6	6·8	5·4	12·8	10·1
09	11 47·3	11 49·2	11 15·0	0·9	0·7	6·9	5·5	12·9	10·2
10	11 47·5	11 49·4	11 15·3	1·0	0·8	7·0	5·5	13·0	10·3
11	11 47·8	11 49·7	11 15·5	1·1	0·9	7·1	5·6	13·1	10·4
12	11 48·0	11 49·9	11 15·7	1·2	1·0	7·2	5·7	13·2	10·5
13	11 48·3	11 50·2	11 16·0	1·3	1·0	7·3	5·8	13·3	10·5
14	11 48·5	11 50·4	11 16·2	1·4	1·1	7·4	5·9	13·4	10·6
15	11 48·8	11 50·7	11 16·5	1·5	1·2	7·5	5·9	13·5	10·7
16	11 49·0	11 50·9	11 16·7	1·6	1·3	7·6	6·0	13·6	10·8
17	11 49·3	11 51·2	11 16·9	1·7	1·3	7·7	6·1	13·7	10·8
18	11 49·5	11 51·4	11 17·2	1·8	1·4	7·8	6·2	13·8	10·9
19	11 49·8	11 51·7	11 17·4	1·9	1·5	7·9	6·3	13·9	11·0
20	11 50·0	11 51·9	11 17·7	2·0	1·6	8·0	6·3	14·0	11·1
21	11 50·3	11 52·2	11 17·9	2·1	1·7	8·1	6·4	14·1	11·2
22	11 50·5	11 52·4	11 18·1	2·2	1·7	8·2	6·5	14·2	11·2
23	11 50·8	11 52·7	11 18·4	2·3	1·8	8·3	6·6	14·3	11·3
24	11 51·0	11 52·9	11 18·6	2·4	1·9	8·4	6·7	14·4	11·4
25	11 51·3	11 53·2	11 18·8	2·5	2·0	8·5	6·7	14·5	11·5
26	11 51·5	11 53·4	11 19·1	2·6	2·1	8·6	6·8	14·6	11·6
27	11 51·8	11 53·7	11 19·3	2·7	2·1	8·7	6·9	14·7	11·6
28	11 52·0	11 53·9	11 19·6	2·8	2·2	8·8	7·0	14·8	11·7
29	11 52·3	11 54·2	11 19·8	2·9	2·3	8·9	7·0	14·9	11·8
30	11 52·5	11 54·5	11 20·0	3·0	2·4	9·0	7·1	15·0	11·9
31	11 52·8	11 54·7	11 20·3	3·1	2·5	9·1	7·2	15·1	12·0
32	11 53·0	11 55·0	11 20·5	3·2	2·5	9·2	7·3	15·2	12·0
33	11 53·3	11 55·2	11 20·8	3·3	2·6	9·3	7·4	15·3	12·1
34	11 53·5	11 55·5	11 21·0	3·4	2·7	9·4	7·4	15·4	12·2
35	11 53·8	11 55·7	11 21·2	3·5	2·8	9·5	7·5	15·5	12·3
36	11 54·0	11 56·0	11 21·5	3·6	2·9	9·6	7·6	15·6	12·4
37	11 54·3	11 56·2	11 21·7	3·7	2·9	9·7	7·7	15·7	12·4
38	11 54·5	11 56·5	11 22·0	3·8	3·0	9·8	7·8	15·8	12·5
39	11 54·8	11 56·7	11 22·2	3·9	3·1	9·9	7·8	15·9	12·6
40	11 55·0	11 57·0	11 22·4	4·0	3·2	10·0	7·9	16·0	12·7
41	11 55·3	11 57·2	11 22·7	4·1	3·2	10·1	8·0	16·1	12·7
42	11 55·5	11 57·5	11 22·9	4·2	3·3	10·2	8·1	16·2	12·8
43	11 55·8	11 57·7	11 23·1	4·3	3·4	10·3	8·2	16·3	12·9
44	11 56·0	11 58·0	11 23·4	4·4	3·5	10·4	8·2	16·4	13·0
45	11 56·3	11 58·2	11 23·6	4·5	3·6	10·5	8·3	16·5	13·1
46	11 56·5	11 58·5	11 23·9	4·6	3·6	10·6	8·4	16·6	13·1
47	11 56·8	11 58·7	11 24·1	4·7	3·7	10·7	8·5	16·7	13·2
48	11 57·0	11 59·0	11 24·3	4·8	3·8	10·8	8·6	16·8	13·3
49	11 57·3	11 59·2	11 24·6	4·9	3·9	10·9	8·6	16·9	13·4
50	11 57·5	11 59·5	11 24·8	5·0	4·0	11·0	8·7	17·0	13·5
51	11 57·8	11 59·7	11 25·1	5·1	4·0	11·1	8·8	17·1	13·5
52	11 58·0	12 00·0	11 25·3	5·2	4·1	11·2	8·9	17·2	13·6
53	11 58·3	12 00·2	11 25·5	5·3	4·2	11·3	8·9	17·3	13·7
54	11 58·5	12 00·5	11 25·8	5·4	4·3	11·4	9·0	17·4	13·8
55	11 58·8	12 00·7	11 26·0	5·5	4·4	11·5	9·1	17·5	13·9
56	11 59·0	12 01·0	11 26·2	5·6	4·4	11·6	9·2	17·6	13·9
57	11 59·3	12 01·2	11 26·5	5·7	4·5	11·7	9·3	17·7	14·0
58	11 59·5	12 01·5	11 26·7	5·8	4·6	11·8	9·3	17·8	14·1
59	11 59·8	12 01·7	11 27·0	5·9	4·7	11·9	9·4	17·9	14·2
60	12 00·0	12 02·0	11 27·2	6·0	4·8	12·0	9·5	18·0	14·3

48m	SOL PLANETAS	ARIES	LUNA	v o d	Corrn	v o d	Corrn	v o d	Corrn
s	° ′	° ′	° ′	′	′	′	′	′	′
00	12 00·0	12 02·0	11 27·2	0·0	0·0	6·0	4·9	12·0	9·7
01	12 00·3	12 02·2	11 27·4	0·1	0·1	6·1	4·9	12·1	9·8
02	12 00·5	12 02·5	11 27·7	0·2	0·2	6·2	5·0	12·2	9·9
03	12 00·8	12 02·7	11 27·9	0·3	0·2	6·3	5·1	12·3	9·9
04	12 01·0	12 03·0	11 28·2	0·4	0·3	6·4	5·2	12·4	10·0
05	12 01·3	12 03·2	11 28·4	0·5	0·4	6·5	5·3	12·5	10·1
06	12 01·5	12 03·5	11 28·6	0·6	0·5	6·6	5·3	12·6	10·2
07	12 01·8	12 03·7	11 28·9	0·7	0·6	6·7	5·4	12·7	10·3
08	12 02·0	12 04·0	11 29·1	0·8	0·6	6·8	5·5	12·8	10·3
09	12 02·3	12 04·2	11 29·3	0·9	0·7	6·9	5·6	12·9	10·4
10	12 02·5	12 04·5	11 29·6	1·0	0·8	7·0	5·7	13·0	10·5
11	12 02·8	12 04·7	11 29·8	1·1	0·9	7·1	5·7	13·1	10·6
12	12 03·0	12 05·0	11 30·1	1·2	1·0	7·2	5·8	13·2	10·7
13	12 03·3	12 05·2	11 30·3	1·3	1·1	7·3	5·9	13·3	10·8
14	12 03·5	12 05·5	11 30·5	1·4	1·1	7·4	6·0	13·4	10·8
15	12 03·8	12 05·7	11 30·8	1·5	1·2	7·5	6·1	13·5	10·9
16	12 04·0	12 06·0	11 31·0	1·6	1·3	7·6	6·1	13·6	11·0
17	12 04·3	12 06·2	11 31·3	1·7	1·4	7·7	6·2	13·7	11·1
18	12 04·5	12 06·5	11 31·5	1·8	1·5	7·8	6·3	13·8	11·2
19	12 04·8	12 06·7	11 31·7	1·9	1·5	7·9	6·4	13·9	11·2
20	12 05·0	12 07·0	11 32·0	2·0	1·6	8·0	6·5	14·0	11·3
21	12 05·3	12 07·2	11 32·2	2·1	1·7	8·1	6·5	14·1	11·4
22	12 05·5	12 07·5	11 32·4	2·2	1·8	8·2	6·6	14·2	11·5
23	12 05·8	12 07·7	11 32·7	2·3	1·9	8·3	6·7	14·3	11·6
24	12 06·0	12 08·0	11 32·9	2·4	1·9	8·4	6·8	14·4	11·6
25	12 06·3	12 08·2	11 33·2	2·5	2·0	8·5	6·9	14·5	11·7
26	12 06·5	12 08·5	11 33·4	2·6	2·1	8·6	7·0	14·6	11·8
27	12 06·8	12 08·7	11 33·6	2·7	2·2	8·7	7·0	14·7	11·9
28	12 07·0	12 09·0	11 33·9	2·8	2·3	8·8	7·1	14·8	12·0
29	12 07·3	12 09·2	11 34·1	2·9	2·3	8·9	7·2	14·9	12·0
30	12 07·5	12 09·5	11 34·4	3·0	2·4	9·0	7·3	15·0	12·1
31	12 07·8	12 09·7	11 34·6	3·1	2·5	9·1	7·4	15·1	12·2
32	12 08·0	12 10·0	11 34·8	3·2	2·6	9·2	7·4	15·2	12·3
33	12 08·3	12 10·2	11 35·1	3·3	2·7	9·3	7·5	15·3	12·4
34	12 08·5	12 10·5	11 35·3	3·4	2·7	9·4	7·6	15·4	12·4
35	12 08·8	12 10·7	11 35·6	3·5	2·8	9·5	7·7	15·5	12·5
36	12 09·0	12 11·0	11 35·8	3·6	2·9	9·6	7·8	15·6	12·6
37	12 09·3	12 11·2	11 36·0	3·7	3·0	9·7	7·8	15·7	12·7
38	12 09·5	12 11·5	11 36·3	3·8	3·1	9·8	7·9	15·8	12·8
39	12 09·8	12 11·7	11 36·5	3·9	3·2	9·9	8·0	15·9	12·9
40	12 10·0	12 12·0	11 36·7	4·0	3·2	10·0	8·1	16·0	12·9
41	12 10·3	12 12·2	11 37·0	4·1	3·3	10·1	8·2	16·1	13·0
42	12 10·5	12 12·5	11 37·2	4·2	3·4	10·2	8·2	16·2	13·1
43	12 10·8	12 12·8	11 37·5	4·3	3·5	10·3	8·3	16·3	13·2
44	12 11·0	12 13·0	11 37·7	4·4	3·6	10·4	8·4	16·4	13·3
45	12 11·3	12 13·3	11 37·9	4·5	3·6	10·5	8·5	16·5	13·3
46	12 11·5	12 13·5	11 38·2	4·6	3·7	10·6	8·6	16·6	13·4
47	12 11·8	12 13·8	11 38·4	4·7	3·8	10·7	8·6	16·7	13·5
48	12 12·0	12 14·0	11 38·7	4·8	3·9	10·8	8·7	16·8	13·6
49	12 12·3	12 14·3	11 38·9	4·9	4·0	10·9	8·8	16·9	13·7
50	12 12·5	12 14·5	11 39·1	5·0	4·0	11·0	8·9	17·0	13·7
51	12 12·8	12 14·8	11 39·4	5·1	4·1	11·1	9·0	17·1	13·8
52	12 13·0	12 15·0	11 39·6	5·2	4·2	11·2	9·1	17·2	13·9
53	12 13·3	12 15·3	11 39·8	5·3	4·3	11·3	9·1	17·3	14·0
54	12 13·5	12 15·5	11 40·1	5·4	4·4	11·4	9·2	17·4	14·1
55	12 13·8	12 15·8	11 40·3	5·5	4·4	11·5	9·3	17·5	14·1
56	12 14·0	12 16·0	11 40·6	5·6	4·5	11·6	9·4	17·6	14·2
57	12 14·3	12 16·3	11 40·8	5·7	4·6	11·7	9·5	17·7	14·3
58	12 14·5	12 16·5	11 41·0	5·8	4·7	11·8	9·5	17·8	14·4
59	12 14·8	12 16·8	11 41·3	5·9	4·8	11·9	9·6	17·9	14·5
60	12 15·0	12 17·0	11 41·5	6·0	4·9	12·0	9·7	18·0	14·6

49m	SOL PLANETAS	ARIES	LUNA	v o d	Corrn	v o d	Corrn	v o d	Corrn
s	° ′	° ′	° ′	′	′	′	′	′	′
00	12 15·0	12 17·0	11 41·5	0·0	0·0	6·0	5·0	12·0	9·9
01	12 15·3	12 17·3	11 41·8	0·1	0·1	6·1	5·0	12·1	10·0
02	12 15·5	12 17·5	11 42·0	0·2	0·2	6·2	5·1	12·2	10·1
03	12 15·8	12 17·8	11 42·2	0·3	0·2	6·3	5·2	12·3	10·1
04	12 16·0	12 18·0	11 42·5	0·4	0·3	6·4	5·3	12·4	10·2
05	12 16·3	12 18·3	11 42·7	0·5	0·4	6·5	5·4	12·5	10·3
06	12 16·5	12 18·5	11 42·9	0·6	0·5	6·6	5·4	12·6	10·4
07	12 16·8	12 18·8	11 43·2	0·7	0·6	6·7	5·5	12·7	10·5
08	12 17·0	12 19·0	11 43·4	0·8	0·7	6·8	5·6	12·8	10·6
09	12 17·3	12 19·3	11 43·7	0·9	0·7	6·9	5·7	12·9	10·6
10	12 17·5	12 19·5	11 43·9	1·0	0·8	7·0	5·8	13·0	10·7
11	12 17·8	12 19·8	11 44·1	1·1	0·9	7·1	5·9	13·1	10·8
12	12 18·0	12 20·0	11 44·4	1·2	1·0	7·2	5·9	13·2	10·9
13	12 18·3	12 20·3	11 44·6	1·3	1·1	7·3	6·0	13·3	11·0
14	12 18·5	12 20·5	11 44·9	1·4	1·2	7·4	6·1	13·4	11·1
15	12 18·8	12 20·8	11 45·1	1·5	1·2	7·5	6·2	13·5	11·1
16	12 19·0	12 21·0	11 45·3	1·6	1·3	7·6	6·3	13·6	11·2
17	12 19·3	12 21·3	11 45·6	1·7	1·4	7·7	6·4	13·7	11·3
18	12 19·5	12 21·5	11 45·8	1·8	1·5	7·8	6·4	13·8	11·4
19	12 19·8	12 21·8	11 46·1	1·9	1·6	7·9	6·5	13·9	11·5
20	12 20·0	12 22·0	11 46·3	2·0	1·7	8·0	6·6	14·0	11·6
21	12 20·3	12 22·3	11 46·5	2·1	1·7	8·1	6·7	14·1	11·6
22	12 20·5	12 22·5	11 46·8	2·2	1·8	8·2	6·8	14·2	11·7
23	12 20·8	12 22·8	11 47·0	2·3	1·9	8·3	6·8	14·3	11·8
24	12 21·0	12 23·0	11 47·2	2·4	2·0	8·4	6·9	14·4	11·9
25	12 21·3	12 23·3	11 47·5	2·5	2·1	8·5	7·0	14·5	12·0
26	12 21·5	12 23·5	11 47·7	2·6	2·1	8·6	7·1	14·6	12·0
27	12 21·8	12 23·8	11 48·0	2·7	2·2	8·7	7·2	14·7	12·1
28	12 22·0	12 24·0	11 48·2	2·8	2·3	8·8	7·3	14·8	12·2
29	12 22·3	12 24·3	11 48·4	2·9	2·4	8·9	7·3	14·9	12·3
30	12 22·5	12 24·5	11 48·7	3·0	2·5	9·0	7·4	15·0	12·4
31	12 22·8	12 24·8	11 48·9	3·1	2·6	9·1	7·5	15·1	12·5
32	12 23·0	12 25·0	11 49·2	3·2	2·6	9·2	7·6	15·2	12·5
33	12 23·3	12 25·3	11 49·4	3·3	2·7	9·3	7·7	15·3	12·6
34	12 23·5	12 25·5	11 49·6	3·4	2·8	9·4	7·8	15·4	12·7
35	12 23·8	12 25·8	11 49·9	3·5	2·9	9·5	7·8	15·5	12·8
36	12 24·0	12 26·0	11 50·1	3·6	3·0	9·6	7·9	15·6	12·9
37	12 24·3	12 26·3	11 50·3	3·7	3·1	9·7	8·0	15·7	13·0
38	12 24·5	12 26·5	11 50·6	3·8	3·1	9·8	8·1	15·8	13·0
39	12 24·8	12 26·8	11 50·8	3·9	3·2	9·9	8·2	15·9	13·1
40	12 25·0	12 27·0	11 51·1	4·0	3·3	10·0	8·3	16·0	13·2
41	12 25·3	12 27·3	11 51·3	4·1	3·4	10·1	8·3	16·1	13·3
42	12 25·5	12 27·5	11 51·5	4·2	3·5	10·2	8·4	16·2	13·4
43	12 25·8	12 27·8	11 51·8	4·3	3·5	10·3	8·5	16·3	13·4
44	12 26·0	12 28·0	11 52·0	4·4	3·6	10·4	8·6	16·4	13·5
45	12 26·3	12 28·3	11 52·3	4·5	3·7	10·5	8·7	16·5	13·6
46	12 26·5	12 28·5	11 52·5	4·6	3·8	10·6	8·7	16·6	13·7
47	12 26·8	12 28·8	11 52·7	4·7	3·9	10·7	8·8	16·7	13·8
48	12 27·0	12 29·0	11 53·0	4·8	4·0	10·8	8·9	16·8	13·9
49	12 27·3	12 29·3	11 53·2	4·9	4·0	10·9	9·0	16·9	13·9
50	12 27·5	12 29·5	11 53·4	5·0	4·1	11·0	9·1	17·0	14·0
51	12 27·8	12 29·8	11 53·7	5·1	4·2	11·1	9·2	17·1	14·1
52	12 28·0	12 30·0	11 53·9	5·2	4·3	11·2	9·2	17·2	14·2
53	12 28·3	12 30·3	11 54·2	5·3	4·4	11·3	9·3	17·3	14·3
54	12 28·5	12 30·5	11 54·4	5·4	4·5	11·4	9·4	17·4	14·4
55	12 28·8	12 30·8	11 54·6	5·5	4·5	11·5	9·5	17·5	14·4
56	12 29·0	12 31·1	11 54·9	5·6	4·6	11·6	9·6	17·6	14·5
57	12 29·3	12 31·3	11 55·1	5·7	4·7	11·7	9·7	17·7	14·6
58	12 29·5	12 31·6	11 55·4	5·8	4·8	11·8	9·7	17·8	14·7
59	12 29·8	12 31·8	11 55·6	5·9	4·9	11·9	9·8	17·9	14·8
60	12 30·0	12 32·1	11 55·8	6·0	5·0	12·0	9·9	18·0	14·9

50m	SOL PLANETAS	ARIES	LUNA	v o d	Corrn	v o d	Corrn	v o d	Corrn
s	° ′	° ′	° ′	′	′	′	′	′	′
00	12 30·0	12 32·1	11 55·8	0·0	0·0	6·0	5·1	12·0	10·1
01	12 30·3	12 32·3	11 56·1	0·1	0·1	6·1	5·1	12·1	10·2
02	12 30·5	12 32·6	11 56·3	0·2	0·2	6·2	5·2	12·2	10·3
03	12 30·8	12 32·8	11 56·5	0·3	0·3	6·3	5·3	12·3	10·4
04	12 31·0	12 33·1	11 56·8	0·4	0·3	6·4	5·4	12·4	10·4
05	12 31·3	12 33·3	11 57·0	0·5	0·4	6·5	5·5	12·5	10·5
06	12 31·5	12 33·6	11 57·3	0·6	0·5	6·6	5·6	12·6	10·6
07	12 31·8	12 33·8	11 57·5	0·7	0·6	6·7	5·6	12·7	10·7
08	12 32·0	12 34·1	11 57·7	0·8	0·7	6·8	5·7	12·8	10·8
09	12 32·3	12 34·3	11 58·0	0·9	0·8	6·9	5·8	12·9	10·9
10	12 32·5	12 34·6	11 58·2	1·0	0·8	7·0	5·9	13·0	10·9
11	12 32·8	12 34·8	11 58·5	1·1	0·9	7·1	6·0	13·1	11·0
12	12 33·0	12 35·1	11 58·7	1·2	1·0	7·2	6·1	13·2	11·1
13	12 33·3	12 35·3	11 58·9	1·3	1·1	7·3	6·1	13·3	11·2
14	12 33·5	12 35·6	11 59·2	1·4	1·2	7·4	6·2	13·4	11·3
15	12 33·8	12 35·8	11 59·4	1·5	1·3	7·5	6·3	13·5	11·4
16	12 34·0	12 36·1	11 59·7	1·6	1·3	7·6	6·4	13·6	11·4
17	12 34·3	12 36·3	11 59·9	1·7	1·4	7·7	6·5	13·7	11·5
18	12 34·5	12 36·6	12 00·1	1·8	1·5	7·8	6·6	13·8	11·6
19	12 34·8	12 36·8	12 00·4	1·9	1·6	7·9	6·6	13·9	11·7
20	12 35·0	12 37·1	12 00·6	2·0	1·7	8·0	6·7	14·0	11·8
21	12 35·3	12 37·3	12 00·8	2·1	1·8	8·1	6·8	14·1	11·9
22	12 35·5	12 37·6	12 01·1	2·2	1·9	8·2	6·9	14·2	12·0
23	12 35·8	12 37·8	12 01·3	2·3	1·9	8·3	7·0	14·3	12·0
24	12 36·0	12 38·1	12 01·6	2·4	2·0	8·4	7·1	14·4	12·1
25	12 36·3	12 38·3	12 01·8	2·5	2·1	8·5	7·2	14·5	12·2
26	12 36·5	12 38·6	12 02·0	2·6	2·2	8·6	7·2	14·6	12·3
27	12 36·8	12 38·8	12 02·3	2·7	2·3	8·7	7·3	14·7	12·4
28	12 37·0	12 39·1	12 02·5	2·8	2·4	8·8	7·4	14·8	12·5
29	12 37·3	12 39·3	12 02·8	2·9	2·4	8·9	7·5	14·9	12·5
30	12 37·5	12 39·6	12 03·0	3·0	2·5	9·0	7·6	15·0	12·6
31	12 37·8	12 39·8	12 03·2	3·1	2·6	9·1	7·7	15·1	12·7
32	12 38·0	12 40·1	12 03·5	3·2	2·7	9·2	7·7	15·2	12·8
33	12 38·3	12 40·3	12 03·7	3·3	2·8	9·3	7·8	15·3	12·9
34	12 38·5	12 40·6	12 03·9	3·4	2·9	9·4	7·9	15·4	13·0
35	12 38·8	12 40·8	12 04·2	3·5	2·9	9·5	8·0	15·5	13·0
36	12 39·0	12 41·1	12 04·4	3·6	3·0	9·6	8·1	15·6	13·1
37	12 39·3	12 41·3	12 04·7	3·7	3·1	9·7	8·2	15·7	13·2
38	12 39·5	12 41·6	12 04·9	3·8	3·2	9·8	8·2	15·8	13·3
39	12 39·8	12 41·8	12 05·1	3·9	3·3	9·9	8·3	15·9	13·4
40	12 40·0	12 42·1	12 05·4	4·0	3·4	10·0	8·4	16·0	13·5
41	12 40·3	12 42·3	12 05·6	4·1	3·5	10·1	8·5	16·1	13·6
42	12 40·5	12 42·6	12 05·9	4·2	3·5	10·2	8·6	16·2	13·6
43	12 40·8	12 42·8	12 06·1	4·3	3·6	10·3	8·7	16·3	13·7
44	12 41·0	12 43·1	12 06·3	4·4	3·7	10·4	8·8	16·4	13·8
45	12 41·3	12 43·3	12 06·6	4·5	3·8	10·5	8·8	16·5	13·9
46	12 41·5	12 43·6	12 06·8	4·6	3·9	10·6	8·9	16·6	14·0
47	12 41·8	12 43·8	12 07·0	4·7	4·0	10·7	9·0	16·7	14·1
48	12 42·0	12 44·1	12 07·3	4·8	4·0	10·8	9·1	16·8	14·1
49	12 42·3	12 44·3	12 07·5	4·9	4·1	10·9	9·2	16·9	14·2
50	12 42·5	12 44·6	12 07·8	5·0	4·2	11·0	9·3	17·0	14·3
51	12 42·8	12 44·8	12 08·0	5·1	4·3	11·1	9·3	17·1	14·4
52	12 43·0	12 45·1	12 08·2	5·2	4·4	11·2	9·4	17·2	14·5
53	12 43·3	12 45·3	12 08·5	5·3	4·5	11·3	9·5	17·3	14·6
54	12 43·5	12 45·6	12 08·7	5·4	4·5	11·4	9·6	17·4	14·6
55	12 43·8	12 45·8	12 09·0	5·5	4·6	11·5	9·7	17·5	14·7
56	12 44·0	12 46·1	12 09·2	5·6	4·7	11·6	9·8	17·6	14·8
57	12 44·3	12 46·3	12 09·4	5·7	4·8	11·7	9·8	17·7	14·9
58	12 44·5	12 46·6	12 09·7	5·8	4·9	11·8	9·9	17·8	15·0
59	12 44·8	12 46·8	12 09·9	5·9	5·0	11·9	10·0	17·9	15·1
60	12 45·0	12 47·1	12 10·2	6·0	5·1	12·0	10·1	18·0	15·2

51m	SOL PLANETAS	ARIES	LUNA	v o d	Corrn	v o d	Corrn	v o d	Corrn
s	° ′	° ′	° ′	′	′	′	′	′	′
00	12 45·0	12 47·1	12 10·2	0·0	0·0	6·0	5·2	12·0	10·3
01	12 45·3	12 47·3	12 10·4	0·1	0·1	6·1	5·2	12·1	10·4
02	12 45·5	12 47·6	12 10·6	0·2	0·2	6·2	5·3	12·2	10·5
03	12 45·8	12 47·8	12 10·9	0·3	0·3	6·3	5·4	12·3	10·6
04	12 46·0	12 48·1	12 11·1	0·4	0·3	6·4	5·5	12·4	10·6
05	12 46·3	12 48·3	12 11·3	0·5	0·4	6·5	5·6	12·5	10·7
06	12 46·5	12 48·6	12 11·6	0·6	0·5	6·6	5·7	12·6	10·8
07	12 46·8	12 48·8	12 11·8	0·7	0·6	6·7	5·8	12·7	10·9
08	12 47·0	12 49·1	12 12·1	0·8	0·7	6·8	5·8	12·8	11·0
09	12 47·3	12 49·4	12 12·3	0·9	0·8	6·9	5·9	12·9	11·1
10	12 47·5	12 49·6	12 12·5	1·0	0·9	7·0	6·0	13·0	11·2
11	12 47·8	12 49·9	12 12·8	1·1	0·9	7·1	6·1	13·1	11·2
12	12 48·0	12 50·1	12 13·0	1·2	1·0	7·2	6·2	13·2	11·3
13	12 48·3	12 50·4	12 13·3	1·3	1·1	7·3	6·3	13·3	11·4
14	12 48·5	12 50·6	12 13·5	1·4	1·2	7·4	6·4	13·4	11·5
15	12 48·8	12 50·9	12 13·7	1·5	1·3	7·5	6·4	13·5	11·6
16	12 49·0	12 51·1	12 14·0	1·6	1·4	7·6	6·5	13·6	11·7
17	12 49·3	12 51·4	12 14·2	1·7	1·5	7·7	6·6	13·7	11·8
18	12 49·5	12 51·6	12 14·4	1·8	1·5	7·8	6·7	13·8	11·8
19	12 49·8	12 51·9	12 14·7	1·9	1·6	7·9	6·8	13·9	11·9
20	12 50·0	12 52·1	12 14·9	2·0	1·7	8·0	6·9	14·0	12·0
21	12 50·3	12 52·4	12 15·2	2·1	1·8	8·1	7·0	14·1	12·1
22	12 50·5	12 52·6	12 15·4	2·2	1·9	8·2	7·0	14·2	12·2
23	12 50·8	12 52·9	12 15·6	2·3	2·0	8·3	7·1	14·3	12·3
24	12 51·0	12 53·1	12 15·9	2·4	2·1	8·4	7·2	14·4	12·4
25	12 51·3	12 53·4	12 16·1	2·5	2·1	8·5	7·3	14·5	12·4
26	12 51·5	12 53·6	12 16·4	2·6	2·2	8·6	7·4	14·6	12·5
27	12 51·8	12 53·9	12 16·6	2·7	2·3	8·7	7·5	14·7	12·6
28	12 52·0	12 54·1	12 16·8	2·8	2·4	8·8	7·6	14·8	12·7
29	12 52·3	12 54·4	12 17·1	2·9	2·5	8·9	7·6	14·9	12·8
30	12 52·5	12 54·6	12 17·3	3·0	2·6	9·0	7·7	15·0	12·9
31	12 52·8	12 54·9	12 17·5	3·1	2·7	9·1	7·8	15·1	13·0
32	12 53·0	12 55·1	12 17·8	3·2	2·7	9·2	7·9	15·2	13·0
33	12 53·3	12 55·4	12 18·0	3·3	2·8	9·3	8·0	15·3	13·1
34	12 53·5	12 55·6	12 18·3	3·4	2·9	9·4	8·1	15·4	13·2
35	12 53·8	12 55·9	12 18·5	3·5	3·0	9·5	8·2	15·5	13·3
36	12 54·0	12 56·1	12 18·7	3·6	3·1	9·6	8·2	15·6	13·4
37	12 54·3	12 56·4	12 19·0	3·7	3·2	9·7	8·3	15·7	13·5
38	12 54·5	12 56·6	12 19·2	3·8	3·3	9·8	8·4	15·8	13·6
39	12 54·8	12 56·9	12 19·5	3·9	3·3	9·9	8·5	15·9	13·6
40	12 55·0	12 57·1	12 19·7	4·0	3·4	10·0	8·6	16·0	13·7
41	12 55·3	12 57·4	12 19·9	4·1	3·5	10·1	8·7	16·1	13·8
42	12 55·5	12 57·6	12 20·2	4·2	3·6	10·2	8·8	16·2	13·9
43	12 55·8	12 57·9	12 20·4	4·3	3·7	10·3	8·8	16·3	14·0
44	12 56·0	12 58·1	12 20·6	4·4	3·8	10·4	8·9	16·4	14·1
45	12 56·3	12 58·4	12 20·9	4·5	3·9	10·5	9·0	16·5	14·2
46	12 56·5	12 58·6	12 21·1	4·6	3·9	10·6	9·1	16·6	14·2
47	12 56·8	12 58·9	12 21·4	4·7	4·0	10·7	9·2	16·7	14·3
48	12 57·0	12 59·1	12 21·6	4·8	4·1	10·8	9·3	16·8	14·4
49	12 57·3	12 59·4	12 21·8	4·9	4·2	10·9	9·4	16·9	14·5
50	12 57·5	12 59·6	12 22·1	5·0	4·3	11·0	9·4	17·0	14·6
51	12 57·8	12 59·9	12 22·3	5·1	4·4	11·1	9·5	17·1	14·7
52	12 58·0	13 00·1	12 22·6	5·2	4·5	11·2	9·6	17·2	14·8
53	12 58·3	13 00·4	12 22·8	5·3	4·5	11·3	9·7	17·3	14·8
54	12 58·5	13 00·6	12 23·0	5·4	4·6	11·4	9·8	17·4	14·9
55	12 58·8	13 00·9	12 23·3	5·5	4·7	11·5	9·9	17·5	15·0
56	12 59·0	13 01·1	12 23·5	5·6	4·8	11·6	10·0	17·6	15·1
57	12 59·3	13 01·4	12 23·8	5·7	4·9	11·7	10·0	17·7	15·2
58	12 59·5	13 01·6	12 24·0	5·8	5·0	11·8	10·1	17·8	15·3
59	12 59·8	13 01·9	12 24·2	5·9	5·1	11·9	10·2	17·9	15·4
60	13 00·0	13 02·1	12 24·5	6·0	5·2	12·0	10·3	18·0	15·5

52m	SOL PLANETAS	ARIES	LUNA	v o d Corrn		v o d Corrn		v o d Corrn	
s	° ′	° ′	° ′	′	′	′	′	′	′
00	13 00·0	13 02·1	12 24·5	0·0	0·0	6·0	5·3	12·0	10·5
01	13 00·3	13 02·4	12 24·7	0·1	0·1	6·1	5·3	12·1	10·6
02	13 00·5	13 02·6	12 24·9	0·2	0·2	6·2	5·4	12·2	10·7
03	13 00·8	13 02·9	12 25·2	0·3	0·3	6·3	5·5	12·3	10·8
04	13 01·0	13 03·1	12 25·4	0·4	0·4	6·4	5·6	12·4	10·9
05	13 01·3	13 03·4	12 25·7	0·5	0·4	6·5	5·7	12·5	10·9
06	13 01·5	13 03·6	12 25·9	0·6	0·5	6·6	5·8	12·6	11·0
07	13 01·8	13 03·9	12 26·1	0·7	0·6	6·7	5·9	12·7	11·1
08	13 02·0	13 04·1	12 26·4	0·8	0·7	6·8	6·0	12·8	11·2
09	13 02·3	13 04·4	12 26·6	0·9	0·8	6·9	6·0	12·9	11·3
10	13 02·5	13 04·6	12 26·9	1·0	0·9	7·0	6·1	13·0	11·4
11	13 02·8	13 04·9	12 27·1	1·1	1·0	7·1	6·2	13·1	11·5
12	13 03·0	13 05·1	12 27·3	1·2	1·1	7·2	6·3	13·2	11·6
13	13 03·3	13 05·4	12 27·6	1·3	1·1	7·3	6·4	13·3	11·6
14	13 03·5	13 05·6	12 27·8	1·4	1·2	7·4	6·5	13·4	11·7
15	13 03·8	13 05·9	12 28·0	1·5	1·3	7·5	6·6	13·5	11·8
16	13 04·0	13 06·1	12 28·3	1·6	1·4	7·6	6·7	13·6	11·9
17	13 04·3	13 06·4	12 28·5	1·7	1·5	7·7	6·7	13·7	12·0
18	13 04·5	13 06·6	12 28·8	1·8	1·6	7·8	6·8	13·8	12·1
19	13 04·8	13 06·9	12 29·0	1·9	1·7	7·9	6·9	13·9	12·2
20	13 05·0	13 07·1	12 29·2	2·0	1·8	8·0	7·0	14·0	12·3
21	13 05·3	13 07·4	12 29·5	2·1	1·8	8·1	7·1	14·1	12·3
22	13 05·5	13 07·7	12 29·7	2·2	1·9	8·2	7·2	14·2	12·4
23	13 05·8	13 07·9	12 30·0	2·3	2·0	8·3	7·3	14·3	12·5
24	13 06·0	13 08·2	12 30·2	2·4	2·1	8·4	7·4	14·4	12·6
25	13 06·3	13 08·4	12 30·4	2·5	2·2	8·5	7·4	14·5	12·7
26	13 06·5	13 08·7	12 30·7	2·6	2·3	8·6	7·5	14·6	12·8
27	13 06·8	13 08·9	12 30·9	2·7	2·4	8·7	7·6	14·7	12·9
28	13 07·0	13 09·2	12 31·1	2·8	2·5	8·8	7·7	14·8	13·0
29	13 07·3	13 09·4	12 31·4	2·9	2·5	8·9	7·8	14·9	13·0
30	13 07·5	13 09·7	12 31·6	3·0	2·6	9·0	7·9	15·0	13·1
31	13 07·8	13 09·9	12 31·9	3·1	2·7	9·1	8·0	15·1	13·2
32	13 08·0	13 10·2	12 32·1	3·2	2·8	9·2	8·1	15·2	13·3
33	13 08·3	13 10·4	12 32·3	3·3	2·9	9·3	8·1	15·3	13·4
34	13 08·5	13 10·7	12 32·6	3·4	3·0	9·4	8·2	15·4	13·5
35	13 08·8	13 10·9	12 32·8	3·5	3·1	9·5	8·3	15·5	13·6
36	13 09·0	13 11·2	12 33·1	3·6	3·2	9·6	8·4	15·6	13·7
37	13 09·3	13 11·4	12 33·3	3·7	3·2	9·7	8·5	15·7	13·7
38	13 09·5	13 11·7	12 33·5	3·8	3·3	9·8	8·6	15·8	13·8
39	13 09·8	13 11·9	12 33·8	3·9	3·4	9·9	8·7	15·9	13·9
40	13 10·0	13 12·2	12 34·0	4·0	3·5	10·0	8·8	16·0	14·0
41	13 10·3	13 12·4	12 34·2	4·1	3·6	10·1	8·8	16·1	14·1
42	13 10·5	13 12·7	12 34·5	4·2	3·7	10·2	8·9	16·2	14·2
43	13 10·8	13 12·9	12 34·7	4·3	3·8	10·3	9·0	16·3	14·3
44	13 11·0	13 13·2	12 35·0	4·4	3·9	10·4	9·1	16·4	14·4
45	13 11·3	13 13·4	12 35·2	4·5	3·9	10·5	9·2	16·5	14·4
46	13 11·5	13 13·7	12 35·4	4·6	4·0	10·6	9·3	16·6	14·5
47	13 11·8	13 13·9	12 35·7	4·7	4·1	10·7	9·4	16·7	14·6
48	13 12·0	13 14·2	12 35·9	4·8	4·2	10·8	9·5	16·8	14·7
49	13 12·3	13 14·4	12 36·2	4·9	4·3	10·9	9·5	16·9	14·8
50	13 12·5	13 14·7	12 36·4	5·0	4·4	11·0	9·6	17·0	14·9
51	13 12·8	13 14·9	12 36·6	5·1	4·5	11·1	9·7	17·1	15·0
52	13 13·0	13 15·2	12 36·9	5·2	4·6	11·2	9·8	17·2	15·1
53	13 13·3	13 15·4	12 37·1	5·3	4·6	11·3	9·9	17·3	15·1
54	13 13·5	13 15·7	12 37·4	5·4	4·7	11·4	10·0	17·4	15·2
55	13 13·8	13 15·9	12 37·6	5·5	4·8	11·5	10·1	17·5	15·3
56	13 14·0	13 16·2	12 37·8	5·6	4·9	11·6	10·2	17·6	15·4
57	13 14·3	13 16·4	12 38·1	5·7	5·0	11·7	10·2	17·7	15·5
58	13 14·5	13 16·7	12 38·3	5·8	5·1	11·8	10·3	17·8	15·6
59	13 14·8	13 16·9	12 38·5	5·9	5·2	11·9	10·4	17·9	15·7
60	13 15·0	13 17·2	12 38·8	6·0	5·3	12·0	10·5	18·0	15·8

53m	SOL PLANETAS	ARIES	LUNA	v o d Corrn		v o d Corrn		v o d Corrn	
s	° ′	° ′	° ′	′	′	′	′	′	′
00	13 15·0	13 17·2	12 38·8	0·0	0·0	6·0	5·4	12·0	10·7
01	13 15·3	13 17·4	12 39·0	0·1	0·1	6·1	5·4	12·1	10·8
02	13 15·5	13 17·7	12 39·3	0·2	0·2	6·2	5·5	12·2	10·9
03	13 15·8	13 17·9	12 39·5	0·3	0·3	6·3	5·6	12·3	11·0
04	13 16·0	13 18·2	12 39·7	0·4	0·4	6·4	5·7	12·4	11·1
05	13 16·3	13 18·4	12 40·0	0·5	0·4	6·5	5·8	12·5	11·1
06	13 16·5	13 18·7	12 40·2	0·6	0·5	6·6	5·9	12·6	11·2
07	13 16·8	13 18·9	12 40·5	0·7	0·6	6·7	6·0	12·7	11·3
08	13 17·0	13 19·2	12 40·7	0·8	0·7	6·8	6·1	12·8	11·4
09	13 17·3	13 19·4	12 40·9	0·9	0·8	6·9	6·2	12·9	11·5
10	13 17·5	13 19·7	12 41·2	1·0	0·9	7·0	6·2	13·0	11·6
11	13 17·8	13 19·9	12 41·4	1·1	1·0	7·1	6·3	13·1	11·7
12	13 18·0	13 20·2	12 41·6	1·2	1·1	7·2	6·4	13·2	11·8
13	13 18·3	13 20·4	12 41·9	1·3	1·2	7·3	6·5	13·3	11·9
14	13 18·5	13 20·7	12 42·1	1·4	1·2	7·4	6·6	13·4	11·9
15	13 18·8	13 20·9	12 42·4	1·5	1·3	7·5	6·7	13·5	12·0
16	13 19·0	13 21·2	12 42·6	1·6	1·4	7·6	6·8	13·6	12·1
17	13 19·3	13 21·4	12 42·8	1·7	1·5	7·7	6·9	13·7	12·2
18	13 19·5	13 21·7	12 43·1	1·8	1·6	7·8	7·0	13·8	12·3
19	13 19·8	13 21·9	12 43·3	1·9	1·7	7·9	7·0	13·9	12·4
20	13 20·0	13 22·2	12 43·6	2·0	1·8	8·0	7·1	14·0	12·5
21	13 20·3	13 22·4	12 43·8	2·1	1·9	8·1	7·2	14·1	12·6
22	13 20·5	13 22·7	12 44·0	2·2	2·0	8·2	7·3	14·2	12·7
23	13 20·8	13 22·9	12 44·3	2·3	2·1	8·3	7·4	14·3	12·8
24	13 21·0	13 23·2	12 44·5	2·4	2·1	8·4	7·5	14·4	12·8
25	13 21·3	13 23·4	12 44·7	2·5	2·2	8·5	7·6	14·5	12·9
26	13 21·5	13 23·7	12 45·0	2·6	2·3	8·6	7·7	14·6	13·0
27	13 21·8	13 23·9	12 45·2	2·7	2·4	8·7	7·8	14·7	13·1
28	13 22·0	13 24·2	12 45·5	2·8	2·5	8·8	7·8	14·8	13·2
29	13 22·3	13 24·4	12 45·7	2·9	2·6	8·9	7·9	14·9	13·3
30	13 22·5	13 24·7	12 45·9	3·0	2·7	9·0	8·0	15·0	13·4
31	13 22·8	13 24·9	12 46·2	3·1	2·8	9·1	8·1	15·1	13·5
32	13 23·0	13 25·2	12 46·4	3·2	2·9	9·2	8·2	15·2	13·6
33	13 23·3	13 25·4	12 46·7	3·3	2·9	9·3	8·3	15·3	13·6
34	13 23·5	13 25·7	12 46·9	3·4	3·0	9·4	8·4	15·4	13·7
35	13 23·8	13 26·0	12 47·1	3·5	3·1	9·5	8·5	15·5	13·8
36	13 24·0	13 26·2	12 47·4	3·6	3·2	9·6	8·6	15·6	13·9
37	13 24·3	13 26·5	12 47·6	3·7	3·3	9·7	8·6	15·7	14·0
38	13 24·5	13 26·7	12 47·9	3·8	3·4	9·8	8·7	15·8	14·1
39	13 24·8	13 27·0	12 48·1	3·9	3·5	9·9	8·8	15·9	14·2
40	13 25·0	13 27·2	12 48·3	4·0	3·6	10·0	8·9	16·0	14·3
41	13 25·3	13 27·5	12 48·6	4·1	3·7	10·1	9·0	16·1	14·4
42	13 25·5	13 27·7	12 48·8	4·2	3·7	10·2	9·1	16·2	14·4
43	13 25·8	13 28·0	12 49·0	4·3	3·8	10·3	9·2	16·3	14·5
44	13 26·0	13 28·2	12 49·3	4·4	3·9	10·4	9·3	16·4	14·6
45	13 26·3	13 28·5	12 49·5	4·5	4·0	10·5	9·4	16·5	14·7
46	13 26·5	13 28·7	12 49·8	4·6	4·1	10·6	9·5	16·6	14·8
47	13 26·8	13 29·0	12 50·0	4·7	4·2	10·7	9·5	16·7	14·9
48	13 27·0	13 29·2	12 50·2	4·8	4·3	10·8	9·6	16·8	15·0
49	13 27·3	13 29·5	12 50·5	4·9	4·4	10·9	9·7	16·9	15·1
50	13 27·5	13 29·7	12 50·7	5·0	4·5	11·0	9·8	17·0	15·2
51	13 27·8	13 30·0	12 51·0	5·1	4·5	11·1	9·9	17·1	15·2
52	13 28·0	13 30·2	12 51·2	5·2	4·6	11·2	10·0	17·2	15·3
53	13 28·3	13 30·5	12 51·4	5·3	4·7	11·3	10·1	17·3	15·4
54	13 28·5	13 30·7	12 51·7	5·4	4·8	11·4	10·2	17·4	15·5
55	13 28·8	13 31·0	12 51·9	5·5	4·9	11·5	10·3	17·5	15·6
56	13 29·0	13 31·2	12 52·1	5·6	5·0	11·6	10·3	17·6	15·7
57	13 29·3	13 31·5	12 52·4	5·7	5·1	11·7	10·4	17·7	15·8
58	13 29·5	13 31·7	12 52·6	5·8	5·2	11·8	10·5	17·8	15·9
59	13 29·8	13 32·0	12 52·9	5·9	5·3	11·9	10·6	17·9	16·0
60	13 30·0	13 32·2	12 53·1	6·0	5·4	12·0	10·7	18·0	16·1

54m	SOL PLANETAS	ARIES	LUNA	v o d Corrn		v o d Corrn		v o d Corrn	
s	° ′	° ′	° ′	′	′	′	′	′	′
00	13 30·0	13 32·2	12 53·1	0·0	0·0	6·0	5·5	12·0	10·9
01	13 30·3	13 32·5	12 53·3	0·1	0·1	6·1	5·5	12·1	11·0
02	13 30·5	13 32·7	12 53·6	0·2	0·2	6·2	5·6	12·2	11·1
03	13 30·8	13 33·0	12 53·8	0·3	0·3	6·3	5·7	12·3	11·2
04	13 31·0	13 33·2	12 54·1	0·4	0·4	6·4	5·8	12·4	11·3
05	13 31·3	13 33·5	12 54·3	0·5	0·5	6·5	5·9	12·5	11·4
06	13 31·5	13 33·7	12 54·5	0·6	0·5	6·6	6·0	12·6	11·4
07	13 31·8	13 34·0	12 54·8	0·7	0·6	6·7	6·1	12·7	11·5
08	13 32·0	13 34·2	12 55·0	0·8	0·7	6·8	6·2	12·8	11·6
09	13 32·3	13 34·5	12 55·2	0·9	0·8	6·9	6·3	12·9	11·7
10	13 32·5	13 34·7	12 55·5	1·0	0·9	7·0	6·4	13·0	11·8
11	13 32·8	13 35·0	12 55·7	1·1	1·0	7·1	6·4	13·1	11·9
12	13 33·0	13 35·2	12 56·0	1·2	1·1	7·2	6·5	13·2	12·0
13	13 33·3	13 35·5	12 56·2	1·3	1·2	7·3	6·6	13·3	12·1
14	13 33·5	13 35·7	12 56·4	1·4	1·3	7·4	6·7	13·4	12·2
15	13 33·8	13 36·0	12 56·7	1·5	1·4	7·5	6·8	13·5	12·3
16	13 34·0	13 36·2	12 56·9	1·6	1·5	7·6	6·9	13·6	12·4
17	13 34·3	13 36·5	12 57·2	1·7	1·5	7·7	7·0	13·7	12·4
18	13 34·5	13 36·7	12 57·4	1·8	1·6	7·8	7·1	13·8	12·5
19	13 34·8	13 37·0	12 57·6	1·9	1·7	7·9	7·2	13·9	12·6
20	13 35·0	13 37·2	12 57·9	2·0	1·8	8·0	7·3	14·0	12·7
21	13 35·3	13 37·5	12 58·1	2·1	1·9	8·1	7·4	14·1	12·8
22	13 35·5	13 37·7	12 58·3	2·2	2·0	8·2	7·4	14·2	12·9
23	13 35·8	13 38·0	12 58·6	2·3	2·1	8·3	7·5	14·3	13·0
24	13 36·0	13 38·2	12 58·8	2·4	2·2	8·4	7·6	14·4	13·1
25	13 36·3	13 38·5	12 59·1	2·5	2·3	8·5	7·7	14·5	13·2
26	13 36·5	13 38·7	12 59·3	2·6	2·4	8·6	7·8	14·6	13·3
27	13 36·8	13 39·0	12 59·5	2·7	2·5	8·7	7·9	14·7	13·4
28	13 37·0	13 39·2	12 59·8	2·8	2·5	8·8	8·0	14·8	13·4
29	13 37·3	13 39·5	13 00·0	2·9	2·6	8·9	8·1	14·9	13·5
30	13 37·5	13 39·7	13 00·3	3·0	2·7	9·0	8·2	15·0	13·6
31	13 37·8	13 40·0	13 00·5	3·1	2·8	9·1	8·3	15·1	13·7
32	13 38·0	13 40·2	13 00·7	3·2	2·9	9·2	8·4	15·2	13·8
33	13 38·3	13 40·5	13 01·0	3·3	3·0	9·3	8·4	15·3	13·9
34	13 38·5	13 40·7	13 01·2	3·4	3·1	9·4	8·5	15·4	14·0
35	13 38·8	13 41·0	13 01·5	3·5	3·2	9·5	8·6	15·5	14·1
36	13 39·0	13 41·2	13 01·7	3·6	3·3	9·6	8·7	15·6	14·2
37	13 39·3	13 41·5	13 01·9	3·7	3·4	9·7	8·8	15·7	14·3
38	13 39·5	13 41·7	13 02·2	3·8	3·5	9·8	8·9	15·8	14·4
39	13 39·8	13 42·0	13 02·4	3·9	3·5	9·9	9·0	15·9	14·4
40	13 40·0	13 42·2	13 02·6	4·0	3·6	10·0	9·1	16·0	14·5
41	13 40·3	13 42·5	13 02·9	4·1	3·7	10·1	9·2	16·1	14·6
42	13 40·5	13 42·7	13 03·1	4·2	3·8	10·2	9·3	16·2	14·7
43	13 40·8	13 43·0	13 03·4	4·3	3·9	10·3	9·4	16·3	14·8
44	13 41·0	13 43·2	13 03·6	4·4	4·0	10·4	9·4	16·4	14·9
45	13 41·3	13 43·5	13 03·8	4·5	4·1	10·5	9·5	16·5	15·0
46	13 41·5	13 43·7	13 04·1	4·6	4·2	10·6	9·6	16·6	15·1
47	13 41·8	13 44·0	13 04·3	4·7	4·3	10·7	9·7	16·7	15·2
48	13 42·0	13 44·3	13 04·6	4·8	4·4	10·8	9·8	16·8	15·3
49	13 42·3	13 44·5	13 04·8	4·9	4·5	10·9	9·9	16·9	15·4
50	13 42·5	13 44·8	13 05·0	5·0	4·5	11·0	10·0	17·0	15·4
51	13 42·8	13 45·0	13 05·3	5·1	4·6	11·1	10·1	17·1	15·5
52	13 43·0	13 45·3	13 05·5	5·2	4·7	11·2	10·2	17·2	15·6
53	13 43·3	13 45·5	13 05·7	5·3	4·8	11·3	10·3	17·3	15·7
54	13 43·5	13 45·8	13 06·0	5·4	4·9	11·4	10·4	17·4	15·8
55	13 43·8	13 46·0	13 06·2	5·5	5·0	11·5	10·4	17·5	15·9
56	13 44·0	13 46·3	13 06·5	5·6	5·1	11·6	10·5	17·6	16·0
57	13 44·3	13 46·5	13 06·7	5·7	5·2	11·7	10·6	17·7	16·1
58	13 44·5	13 46·8	13 06·9	5·8	5·3	11·8	10·7	17·8	16·2
59	13 44·8	13 47·0	13 07·2	5·9	5·4	11·9	10·8	17·9	16·3
60	13 45·0	13 47·3	13 07·4	6·0	5·5	12·0	10·9	18·0	16·4

55m	SOL PLANETAS	ARIES	LUNA	v o d Corrn		v o d Corrn		v o d Corrn	
s	° ′	° ′	° ′	′	′	′	′	′	′
00	13 45·0	13 47·3	13 07·4	0·0	0·0	6·0	5·6	12·0	11·1
01	13 45·3	13 47·5	13 07·7	0·1	0·1	6·1	5·6	12·1	11·2
02	13 45·5	13 47·8	13 07·9	0·2	0·2	6·2	5·7	12·2	11·3
03	13 45·8	13 48·0	13 08·1	0·3	0·3	6·3	5·8	12·3	11·4
04	13 46·0	13 48·3	13 08·4	0·4	0·4	6·4	5·9	12·4	11·5
05	13 46·3	13 48·5	13 08·6	0·5	0·5	6·5	6·0	12·5	11·6
06	13 46·5	13 48·8	13 08·8	0·6	0·6	6·6	6·1	12·6	11·7
07	13 46·8	13 49·0	13 09·1	0·7	0·6	6·7	6·2	12·7	11·7
08	13 47·0	13 49·3	13 09·3	0·8	0·7	6·8	6·3	12·8	11·8
09	13 47·3	13 49·5	13 09·6	0·9	0·8	6·9	6·4	12·9	11·9
10	13 47·5	13 49·8	13 09·8	1·0	0·9	7·0	6·5	13·0	12·0
11	13 47·8	13 50·0	13 10·0	1·1	1·0	7·1	6·6	13·1	12·1
12	13 48·0	13 50·3	13 10·3	1·2	1·1	7·2	6·7	13·2	12·2
13	13 48·3	13 50·5	13 10·5	1·3	1·2	7·3	6·8	13·3	12·3
14	13 48·5	13 50·8	13 10·8	1·4	1·3	7·4	6·8	13·4	12·4
15	13 48·8	13 51·0	13 11·0	1·5	1·4	7·5	6·9	13·5	12·5
16	13 49·0	13 51·3	13 11·2	1·6	1·5	7·6	7·0	13·6	12·6
17	13 49·3	13 51·5	13 11·5	1·7	1·6	7·7	7·1	13·7	12·7
18	13 49·5	13 51·8	13 11·7	1·8	1·7	7·8	7·2	13·8	12·8
19	13 49·8	13 52·0	13 12·0	1·9	1·8	7·9	7·3	13·9	12·9
20	13 50·0	13 52·3	13 12·2	2·0	1·9	8·0	7·4	14·0	13·0
21	13 50·3	13 52·5	13 12·4	2·1	1·9	8·1	7·5	14·1	13·0
22	13 50·5	13 52·8	13 12·7	2·2	2·0	8·2	7·6	14·2	13·1
23	13 50·8	13 53·0	13 12·9	2·3	2·1	8·3	7·7	14·3	13·2
24	13 51·0	13 53·3	13 13·1	2·4	2·2	8·4	7·8	14·4	13·3
25	13 51·3	13 53·5	13 13·4	2·5	2·3	8·5	7·9	14·5	13·4
26	13 51·5	13 53·8	13 13·6	2·6	2·4	8·6	8·0	14·6	13·5
27	13 51·8	13 54·0	13 13·9	2·7	2·5	8·7	8·0	14·7	13·6
28	13 52·0	13 54·3	13 14·1	2·8	2·6	8·8	8·1	14·8	13·7
29	13 52·3	13 54·5	13 14·3	2·9	2·7	8·9	8·2	14·9	13·8
30	13 52·5	13 54·8	13 14·6	3·0	2·8	9·0	8·3	15·0	13·9
31	13 52·8	13 55·0	13 14·8	3·1	2·9	9·1	8·4	15·1	14·0
32	13 53·0	13 55·3	13 15·1	3·2	3·0	9·2	8·5	15·2	14·1
33	13 53·3	13 55·5	13 15·3	3·3	3·1	9·3	8·6	15·3	14·2
34	13 53·5	13 55·8	13 15·5	3·4	3·1	9·4	8·7	15·4	14·2
35	13 53·8	13 56·0	13 15·8	3·5	3·2	9·5	8·8	15·5	14·3
36	13 54·0	13 56·3	13 16·0	3·6	3·3	9·6	8·9	15·6	14·4
37	13 54·3	13 56·5	13 16·2	3·7	3·4	9·7	9·0	15·7	14·5
38	13 54·5	13 56·8	13 16·5	3·8	3·5	9·8	9·1	15·8	14·6
39	13 54·8	13 57·0	13 16·7	3·9	3·6	9·9	9·2	15·9	14·7
40	13 55·0	13 57·3	13 17·0	4·0	3·7	10·0	9·3	16·0	14·8
41	13 55·3	13 57·5	13 17·2	4·1	3·8	10·1	9·3	16·1	14·9
42	13 55·5	13 57·8	13 17·4	4·2	3·9	10·2	9·4	16·2	15·0
43	13 55·8	13 58·0	13 17·7	4·3	4·0	10·3	9·5	16·3	15·1
44	13 56·0	13 58·3	13 17·9	4·4	4·1	10·4	9·6	16·4	15·2
45	13 56·3	13 58·5	13 18·2	4·5	4·2	10·5	9·7	16·5	15·3
46	13 56·5	13 58·8	13 18·4	4·6	4·3	10·6	9·8	16·6	15·4
47	13 56·8	13 59·0	13 18·6	4·7	4·3	10·7	9·9	16·7	15·4
48	13 57·0	13 59·3	13 18·9	4·8	4·4	10·8	10·0	16·8	15·5
49	13 57·3	13 59·5	13 19·1	4·9	4·5	10·9	10·1	16·9	15·6
50	13 57·5	13 59·8	13 19·3	5·0	4·6	11·0	10·2	17·0	15·7
51	13 57·8	14 00·0	13 19·6	5·1	4·7	11·1	10·3	17·1	15·8
52	13 58·0	14 00·3	13 19·8	5·2	4·8	11·2	10·4	17·2	15·9
53	13 58·3	14 00·5	13 20·1	5·3	4·9	11·3	10·5	17·3	16·0
54	13 58·5	14 00·8	13 20·3	5·4	5·0	11·4	10·5	17·4	16·1
55	13 58·8	14 01·0	13 20·5	5·5	5·1	11·5	10·6	17·5	16·2
56	13 59·0	14 01·3	13 20·8	5·6	5·2	11·6	10·7	17·6	16·3
57	13 59·3	14 01·5	13 21·0	5·7	5·3	11·7	10·8	17·7	16·4
58	13 59·5	14 01·8	13 21·3	5·8	5·4	11·8	10·9	17·8	16·5
59	13 59·8	14 02·0	13 21·5	5·9	5·5	11·9	11·0	17·9	16·6
60	14 00·0	14 02·3	13 21·7	6·0	5·6	12·0	11·1	18·0	16·7

56m	SOL PLANETAS	ARIES	LUNA	v o d	Corrn	v o d	Corrn	v o d	Corrn
s	° ′	° ′	° ′	′	′	′	′	′	′
00	14 00·0	14 02·3	13 21·7	0·0	0·0	6·0	5·7	12·0	11·3
01	14 00·3	14 02·6	13 22·0	0·1	0·1	6·1	5·7	12·1	11·4
02	14 00·5	14 02·8	13 22·2	0·2	0·2	6·2	5·8	12·2	11·5
03	14 00·8	14 03·1	13 22·4	0·3	0·3	6·3	5·9	12·3	11·6
04	14 01·0	14 03·3	13 22·7	0·4	0·4	6·4	6·0	12·4	11·7
05	14 01·3	14 03·6	13 22·9	0·5	0·5	6·5	6·1	12·5	11·8
06	14 01·5	14 03·8	13 23·2	0·6	0·6	6·6	6·2	12·6	11·9
07	14 01·8	14 04·1	13 23·4	0·7	0·7	6·7	6·3	12·7	12·0
08	14 02·0	14 04·3	13 23·6	0·8	0·8	6·8	6·4	12·8	12·1
09	14 02·3	14 04·6	13 23·9	0·9	0·8	6·9	6·5	12·9	12·1
10	14 02·5	14 04·8	13 24·1	1·0	0·9	7·0	6·6	13·0	12·2
11	14 02·8	14 05·1	13 24·4	1·1	1·0	7·1	6·7	13·1	12·3
12	14 03·0	14 05·3	13 24·6	1·2	1·1	7·2	6·8	13·2	12·4
13	14 03·3	14 05·6	13 24·8	1·3	1·2	7·3	6·9	13·3	12·5
14	14 03·5	14 05·8	13 25·1	1·4	1·3	7·4	7·0	13·4	12·6
15	14 03·8	14 06·1	13 25·3	1·5	1·4	7·5	7·1	13·5	12·7
16	14 04·0	14 06·3	13 25·6	1·6	1·5	7·6	7·2	13·6	12·8
17	14 04·3	14 06·6	13 25·8	1·7	1·6	7·7	7·3	13·7	12·9
18	14 04·5	14 06·8	13 26·0	1·8	1·7	7·8	7·3	13·8	13·0
19	14 04·8	14 07·1	13 26·3	1·9	1·8	7·9	7·4	13·9	13·1
20	14 05·0	14 07·3	13 26·5	2·0	1·9	8·0	7·5	14·0	13·2
21	14 05·3	14 07·6	13 26·7	2·1	2·0	8·1	7·6	14·1	13·3
22	14 05·5	14 07·8	13 27·0	2·2	2·1	8·2	7·7	14·2	13·4
23	14 05·8	14 08·1	13 27·2	2·3	2·2	8·3	7·8	14·3	13·5
24	14 06·0	14 08·3	13 27·5	2·4	2·3	8·4	7·9	14·4	13·6
25	14 06·3	14 08·6	13 27·7	2·5	2·4	8·5	8·0	14·5	13·7
26	14 06·5	14 08·8	13 27·9	2·6	2·4	8·6	8·1	14·6	13·7
27	14 06·8	14 09·1	13 28·2	2·7	2·5	8·7	8·2	14·7	13·8
28	14 07·0	14 09·3	13 28·4	2·8	2·6	8·8	8·3	14·8	13·9
29	14 07·3	14 09·6	13 28·7	2·9	2·7	8·9	8·4	14·9	14·0
30	14 07·5	14 09·8	13 28·9	3·0	2·8	9·0	8·5	15·0	14·1
31	14 07·8	14 10·1	13 29·1	3·1	2·9	9·1	8·6	15·1	14·2
32	14 08·0	14 10·3	13 29·4	3·2	3·0	9·2	8·7	15·2	14·3
33	14 08·3	14 10·6	13 29·6	3·3	3·1	9·3	8·8	15·3	14·4
34	14 08·5	14 10·8	13 29·8	3·4	3·2	9·4	8·9	15·4	14·5
35	14 08·8	14 11·1	13 30·1	3·5	3·3	9·5	8·9	15·5	14·6
36	14 09·0	14 11·3	13 30·3	3·6	3·4	9·6	9·0	15·6	14·7
37	14 09·3	14 11·6	13 30·6	3·7	3·5	9·7	9·1	15·7	14·8
38	14 09·5	14 11·8	13 30·8	3·8	3·6	9·8	9·2	15·8	14·9
39	14 09·8	14 12·1	13 31·0	3·9	3·7	9·9	9·3	15·9	15·0
40	14 10·0	14 12·3	13 31·3	4·0	3·8	10·0	9·4	16·0	15·1
41	14 10·3	14 12·6	13 31·5	4·1	3·9	10·1	9·5	16·1	15·2
42	14 10·5	14 12·8	13 31·8	4·2	4·0	10·2	9·6	16·2	15·3
43	14 10·8	14 13·1	13 32·0	4·3	4·0	10·3	9·7	16·3	15·3
44	14 11·0	14 13·3	13 32·2	4·4	4·1	10·4	9·8	16·4	15·4
45	14 11·3	14 13·6	13 32·5	4·5	4·2	10·5	9·9	16·5	15·5
46	14 11·5	14 13·8	13 32·7	4·6	4·3	10·6	10·0	16·6	15·6
47	14 11·8	14 14·1	13 32·9	4·7	4·4	10·7	10·1	16·7	15·7
48	14 12·0	14 14·3	13 33·2	4·8	4·5	10·8	10·2	16·8	15·8
49	14 12·3	14 14·6	13 33·4	4·9	4·6	10·9	10·3	16·9	15·9
50	14 12·5	14 14·8	13 33·7	5·0	4·7	11·0	10·4	17·0	16·0
51	14 12·8	14 15·1	13 33·9	5·1	4·8	11·1	10·5	17·1	16·1
52	14 13·0	14 15·3	13 34·1	5·2	4·9	11·2	10·5	17·2	16·2
53	14 13·3	14 15·6	13 34·4	5·3	5·0	11·3	10·6	17·3	16·3
54	14 13·5	14 15·8	13 34·6	5·4	5·1	11·4	10·7	17·4	16·4
55	14 13·8	14 16·1	13 34·9	5·5	5·2	11·5	10·8	17·5	16·5
56	14 14·0	14 16·3	13 35·1	5·6	5·3	11·6	10·9	17·6	16·6
57	14 14·3	14 16·6	13 35·3	5·7	5·4	11·7	11·0	17·7	16·7
58	14 14·5	14 16·8	13 35·6	5·8	5·5	11·8	11·1	17·8	16·8
59	14 14·8	14 17·1	13 35·8	5·9	5·6	11·9	11·2	17·9	16·9
60	14 15·0	14 17·3	13 36·1	6·0	5·7	12·0	11·3	18·0	17·0

57m	SOL PLANETAS	ARIES	LUNA	v o d	Corrn	v o d	Corrn	v o d	Corrn
s	° ′	° ′	° ′	′	′	′	′	′	′
00	14 15·0	14 17·3	13 36·1	0·0	0·0	6·0	5·8	12·0	11·5
01	14 15·3	14 17·6	13 36·3	0·1	0·1	6·1	5·8	12·1	11·6
02	14 15·5	14 17·8	13 36·5	0·2	0·2	6·2	5·9	12·2	11·7
03	14 15·8	14 18·1	13 36·8	0·3	0·3	6·3	6·0	12·3	11·8
04	14 16·0	14 18·3	13 37·0	0·4	0·4	6·4	6·1	12·4	11·9
05	14 16·3	14 18·6	13 37·2	0·5	0·5	6·5	6·2	12·5	12·0
06	14 16·5	14 18·8	13 37·5	0·6	0·6	6·6	6·3	12·6	12·1
07	14 16·8	14 19·1	13 37·7	0·7	0·7	6·7	6·4	12·7	12·2
08	14 17·0	14 19·3	13 38·0	0·8	0·8	6·8	6·5	12·8	12·3
09	14 17·3	14 19·6	13 38·2	0·9	0·9	6·9	6·6	12·9	12·4
10	14 17·5	14 19·8	13 38·4	1·0	1·0	7·0	6·7	13·0	12·5
11	14 17·8	14 20·1	13 38·7	1·1	1·1	7·1	6·8	13·1	12·6
12	14 18·0	14 20·3	13 38·9	1·2	1·2	7·2	6·9	13·2	12·7
13	14 18·3	14 20·6	13 39·2	1·3	1·2	7·3	7·0	13·3	12·7
14	14 18·5	14 20·9	13 39·4	1·4	1·3	7·4	7·1	13·4	12·8
15	14 18·8	14 21·1	13 39·6	1·5	1·4	7·5	7·2	13·5	12·9
16	14 19·0	14 21·4	13 39·9	1·6	1·5	7·6	7·3	13·6	13·0
17	14 19·3	14 21·6	13 40·1	1·7	1·6	7·7	7·4	13·7	13·1
18	14 19·5	14 21·9	13 40·3	1·8	1·7	7·8	7·5	13·8	13·2
19	14 19·8	14 22·1	13 40·6	1·9	1·8	7·9	7·6	13·9	13·3
20	14 20·0	14 22·4	13 40·8	2·0	1·9	8·0	7·7	14·0	13·4
21	14 20·3	14 22·6	13 41·1	2·1	2·0	8·1	7·8	14·1	13·5
22	14 20·5	14 22·9	13 41·3	2·2	2·1	8·2	7·9	14·2	13·6
23	14 20·8	14 23·1	13 41·5	2·3	2·2	8·3	8·0	14·3	13·7
24	14 21·0	14 23·4	13 41·8	2·4	2·3	8·4	8·1	14·4	13·8
25	14 21·3	14 23·6	13 42·0	2·5	2·4	8·5	8·1	14·5	13·9
26	14 21·5	14 23·9	13 42·3	2·6	2·5	8·6	8·2	14·6	14·0
27	14 21·8	14 24·1	13 42·5	2·7	2·6	8·7	8·3	14·7	14·1
28	14 22·0	14 24·4	13 42·7	2·8	2·7	8·8	8·4	14·8	14·2
29	14 22·3	14 24·6	13 43·0	2·9	2·8	8·9	8·5	14·9	14·3
30	14 22·5	14 24·9	13 43·2	3·0	2·9	9·0	8·6	15·0	14·4
31	14 22·8	14 25·1	13 43·4	3·1	3·0	9·1	8·7	15·1	14·5
32	14 23·0	14 25·4	13 43·7	3·2	3·1	9·2	8·8	15·2	14·6
33	14 23·3	14 25·6	13 43·9	3·3	3·2	9·3	8·9	15·3	14·7
34	14 23·5	14 25·9	13 44·2	3·4	3·3	9·4	9·0	15·4	14·8
35	14 23·8	14 26·1	13 44·4	3·5	3·4	9·5	9·1	15·5	14·9
36	14 24·0	14 26·4	13 44·6	3·6	3·5	9·6	9·2	15·6	15·0
37	14 24·3	14 26·6	13 44·9	3·7	3·5	9·7	9·3	15·7	15·0
38	14 24·5	14 26·9	13 45·1	3·8	3·6	9·8	9·4	15·8	15·1
39	14 24·8	14 27·1	13 45·4	3·9	3·7	9·9	9·5	15·9	15·2
40	14 25·0	14 27·4	13 45·6	4·0	3·8	10·0	9·6	16·0	15·3
41	14 25·3	14 27·6	13 45·8	4·1	3·9	10·1	9·7	16·1	15·4
42	14 25·5	14 27·9	13 46·1	4·2	4·0	10·2	9·8	16·2	15·5
43	14 25·8	14 28·1	13 46·3	4·3	4·1	10·3	9·9	16·3	15·6
44	14 26·0	14 28·4	13 46·5	4·4	4·2	10·4	10·0	16·4	15·7
45	14 26·3	14 28·6	13 46·8	4·5	4·3	10·5	10·1	16·5	15·8
46	14 26·5	14 28·9	13 47·0	4·6	4·4	10·6	10·2	16·6	15·9
47	14 26·8	14 29·1	13 47·3	4·7	4·5	10·7	10·3	16·7	16·0
48	14 27·0	14 29·4	13 47·5	4·8	4·6	10·8	10·4	16·8	16·1
49	14 27·3	14 29·6	13 47·7	4·9	4·7	10·9	10·4	16·9	16·2
50	14 27·5	14 29·9	13 48·0	5·0	4·8	11·0	10·5	17·0	16·3
51	14 27·8	14 30·1	13 48·2	5·1	4·9	11·1	10·6	17·1	16·4
52	14 28·0	14 30·4	13 48·5	5·2	5·0	11·2	10·7	17·2	16·5
53	14 28·3	14 30·6	13 48·7	5·3	5·1	11·3	10·8	17·3	16·6
54	14 28·5	14 30·9	13 48·9	5·4	5·2	11·4	10·9	17·4	16·7
55	14 28·8	14 31·1	13 49·2	5·5	5·3	11·5	11·0	17·5	16·8
56	14 29·0	14 31·4	13 49·4	5·6	5·4	11·6	11·1	17·6	16·9
57	14 29·3	14 31·6	13 49·7	5·7	5·5	11·7	11·2	17·7	17·0
58	14 29·5	14 31·9	13 49·9	5·8	5·6	11·8	11·3	17·8	17·1
59	14 29·8	14 32·1	13 50·1	5·9	5·7	11·9	11·4	17·9	17·2
60	14 30·0	14 32·4	13 50·4	6·0	5·8	12·0	11·5	18·0	17·3

58m	SOL PLANETAS	ARIES	LUNA	v o d	Corrn	v o d	Corrn	v o d	Corrn
s	° ′	° ′	° ′	′	′	′	′	′	′
00	14 30·0	14 32·4	13 50·4	0·0	0·0	6·0	5·9	12·0	11·7
01	14 30·3	14 32·6	13 50·6	0·1	0·1	6·1	5·9	12·1	11·8
02	14 30·5	14 32·9	13 50·8	0·2	0·2	6·2	6·0	12·2	11·9
03	14 30·8	14 33·1	13 51·1	0·3	0·3	6·3	6·1	12·3	12·0
04	14 31·0	14 33·4	13 51·3	0·4	0·4	6·4	6·2	12·4	12·1
05	14 31·3	14 33·6	13 51·6	0·5	0·5	6·5	6·3	12·5	12·2
06	14 31·5	14 33·9	13 51·8	0·6	0·6	6·6	6·4	12·6	12·3
07	14 31·8	14 34·1	13 52·0	0·7	0·7	6·7	6·5	12·7	12·4
08	14 32·0	14 34·4	13 52·3	0·8	0·8	6·8	6·6	12·8	12·5
09	14 32·3	14 34·6	13 52·5	0·9	0·9	6·9	6·7	12·9	12·6
10	14 32·5	14 34·9	13 52·8	1·0	1·0	7·0	6·8	13·0	12·7
11	14 32·8	14 35·1	13 53·0	1·1	1·1	7·1	6·9	13·1	12·8
12	14 33·0	14 35·4	13 53·2	1·2	1·2	7·2	7·0	13·2	12·9
13	14 33·3	14 35·6	13 53·5	1·3	1·3	7·3	7·1	13·3	13·0
14	14 33·5	14 35·9	13 53·7	1·4	1·4	7·4	7·2	13·4	13·1
15	14 33·8	14 36·1	13 53·9	1·5	1·5	7·5	7·3	13·5	13·2
16	14 34·0	14 36·4	13 54·2	1·6	1·6	7·6	7·4	13·6	13·3
17	14 34·3	14 36·6	13 54·4	1·7	1·7	7·7	7·5	13·7	13·4
18	14 34·5	14 36·9	13 54·7	1·8	1·8	7·8	7·6	13·8	13·5
19	14 34·8	14 37·1	13 54·9	1·9	1·9	7·9	7·7	13·9	13·6
20	14 35·0	14 37·4	13 55·1	2·0	2·0	8·0	7·8	14·0	13·7
21	14 35·3	14 37·6	13 55·4	2·1	2·0	8·1	7·9	14·1	13·7
22	14 35·5	14 37·9	13 55·6	2·2	2·1	8·2	8·0	14·2	13·8
23	14 35·8	14 38·1	13 55·9	2·3	2·2	8·3	8·1	14·3	13·9
24	14 36·0	14 38·4	13 56·1	2·4	2·3	8·4	8·2	14·4	14·0
25	14 36·3	14 38·6	13 56·3	2·5	2·4	8·5	8·3	14·5	14·1
26	14 36·5	14 38·9	13 56·6	2·6	2·5	8·6	8·4	14·6	14·2
27	14 36·8	14 39·2	13 56·8	2·7	2·6	8·7	8·5	14·7	14·3
28	14 37·0	14 39·4	13 57·0	2·8	2·7	8·8	8·6	14·8	14·4
29	14 37·3	14 39·7	13 57·3	2·9	2·8	8·9	8·7	14·9	14·5
30	14 37·5	14 39·9	13 57·5	3·0	2·9	9·0	8·8	15·0	14·6
31	14 37·8	14 40·2	13 57·8	3·1	3·0	9·1	8·9	15·1	14·7
32	14 38·0	14 40·4	13 58·0	3·2	3·1	9·2	9·0	15·2	14·8
33	14 38·3	14 40·7	13 58·2	3·3	3·2	9·3	9·1	15·3	14·9
34	14 38·5	14 40·9	13 58·5	3·4	3·3	9·4	9·2	15·4	15·0
35	14 38·8	14 41·2	13 58·7	3·5	3·4	9·5	9·3	15·5	15·1
36	14 39·0	14 41·4	13 59·0	3·6	3·5	9·6	9·4	15·6	15·2
37	14 39·3	14 41·7	13 59·2	3·7	3·6	9·7	9·5	15·7	15·3
38	14 39·5	14 41·9	13 59·4	3·8	3·7	9·8	9·6	15·8	15·4
39	14 39·8	14 42·2	13 59·7	3·9	3·8	9·9	9·7	15·9	15·5
40	14 40·0	14 42·4	13 59·9	4·0	3·9	10·0	9·8	16·0	15·6
41	14 40·3	14 42·7	14 00·1	4·1	4·0	10·1	9·8	16·1	15·7
42	14 40·5	14 42·9	14 00·4	4·2	4·1	10·2	9·9	16·2	15·8
43	14 40·8	14 43·2	14 00·6	4·3	4·2	10·3	10·0	16·3	15·9
44	14 41·0	14 43·4	14 00·9	4·4	4·3	10·4	10·1	16·4	16·0
45	14 41·3	14 43·7	14 01·1	4·5	4·4	10·5	10·2	16·5	16·1
46	14 41·5	14 43·9	14 01·3	4·6	4·5	10·6	10·3	16·6	16·2
47	14 41·8	14 44·2	14 01·6	4·7	4·6	10·7	10·4	16·7	16·3
48	14 42·0	14 44·4	14 01·8	4·8	4·7	10·8	10·5	16·8	16·4
49	14 42·3	14 44·7	14 02·1	4·9	4·8	10·9	10·6	16·9	16·5
50	14 42·5	14 44·9	14 02·3	5·0	4·9	11·0	10·7	17·0	16·6
51	14 42·8	14 45·2	14 02·5	5·1	5·0	11·1	10·8	17·1	16·7
52	14 43·0	14 45·4	14 02·8	5·2	5·1	11·2	10·9	17·2	16·8
53	14 43·3	14 45·7	14 03·0	5·3	5·2	11·3	11·0	17·3	16·9
54	14 43·5	14 45·9	14 03·3	5·4	5·3	11·4	11·1	17·4	17·0
55	14 43·8	14 46·2	14 03·5	5·5	5·4	11·5	11·2	17·5	17·1
56	14 44·0	14 46·4	14 03·7	5·6	5·5	11·6	11·3	17·6	17·2
57	14 44·3	14 46·7	14 04·0	5·7	5·6	11·7	11·4	17·7	17·3
58	14 44·5	14 46·9	14 04·2	5·8	5·7	11·8	11·5	17·8	17·4
59	14 44·8	14 47·2	14 04·4	5·9	5·8	11·9	11·6	17·9	17·5
60	14 45·0	14 47·4	14 04·7	6·0	5·9	12·0	11·7	18·0	17·6

59m	SOL PLANETAS	ARIES	LUNA	v o d	Corrn	v o d	Corrn	v o d	Corrn
s	° ′	° ′	° ′	′	′	′	′	′	′
00	14 45·0	14 47·4	14 04·7	0·0	0·0	6·0	6·0	12·0	11·9
01	14 45·3	14 47·7	14 04·9	0·1	0·1	6·1	6·0	12·1	12·0
02	14 45·5	14 47·9	14 05·2	0·2	0·2	6·2	6·1	12·2	12·1
03	14 45·8	14 48·2	14 05·4	0·3	0·3	6·3	6·2	12·3	12·2
04	14 46·0	14 48·4	14 05·6	0·4	0·4	6·4	6·3	12·4	12·3
05	14 46·3	14 48·7	14 05·9	0·5	0·5	6·5	6·4	12·5	12·4
06	14 46·5	14 48·9	14 06·1	0·6	0·6	6·6	6·5	12·6	12·5
07	14 46·8	14 49·2	14 06·4	0·7	0·7	6·7	6·6	12·7	12·6
08	14 47·0	14 49·4	14 06·6	0·8	0·8	6·8	6·7	12·8	12·7
09	14 47·3	14 49·7	14 06·8	0·9	0·9	6·9	6·8	12·9	12·8
10	14 47·5	14 49·9	14 07·1	1·0	1·0	7·0	6·9	13·0	12·9
11	14 47·8	14 50·2	14 07·3	1·1	1·1	7·1	7·0	13·1	13·0
12	14 48·0	14 50·4	14 07·5	1·2	1·2	7·2	7·1	13·2	13·1
13	14 48·3	14 50·7	14 07·8	1·3	1·3	7·3	7·2	13·3	13·2
14	14 48·5	14 50·9	14 08·0	1·4	1·4	7·4	7·3	13·4	13·3
15	14 48·8	14 51·2	14 08·3	1·5	1·5	7·5	7·4	13·5	13·4
16	14 49·0	14 51·4	14 08·5	1·6	1·6	7·6	7·5	13·6	13·5
17	14 49·3	14 51·7	14 08·7	1·7	1·7	7·7	7·6	13·7	13·6
18	14 49·5	14 51·9	14 09·0	1·8	1·8	7·8	7·7	13·8	13·7
19	14 49·8	14 52·2	14 09·2	1·9	1·9	7·9	7·8	13·9	13·8
20	14 50·0	14 52·4	14 09·5	2·0	2·0	8·0	7·9	14·0	13·9
21	14 50·3	14 52·7	14 09·7	2·1	2·1	8·1	8·0	14·1	14·0
22	14 50·5	14 52·9	14 09·9	2·2	2·2	8·2	8·1	14·2	14·1
23	14 50·8	14 53·2	14 10·2	2·3	2·3	8·3	8·2	14·3	14·2
24	14 51·0	14 53·4	14 10·4	2·4	2·4	8·4	8·3	14·4	14·3
25	14 51·3	14 53·7	14 10·6	2·5	2·5	8·5	8·4	14·5	14·4
26	14 51·5	14 53·9	14 10·9	2·6	2·6	8·6	8·5	14·6	14·5
27	14 51·8	14 54·2	14 11·1	2·7	2·7	8·7	8·6	14·7	14·6
28	14 52·0	14 54·4	14 11·4	2·8	2·8	8·8	8·7	14·8	14·7
29	14 52·3	14 54·7	14 11·6	2·9	2·9	8·9	8·8	14·9	14·8
30	14 52·5	14 54·9	14 11·8	3·0	3·0	9·0	8·9	15·0	14·9
31	14 52·8	14 55·2	14 12·1	3·1	3·1	9·1	9·0	15·1	15·0
32	14 53·0	14 55·4	14 12·3	3·2	3·2	9·2	9·1	15·2	15·1
33	14 53·3	14 55·7	14 12·6	3·3	3·3	9·3	9·2	15·3	15·2
34	14 53·5	14 55·9	14 12·8	3·4	3·4	9·4	9·3	15·4	15·3
35	14 53·8	14 56·2	14 13·0	3·5	3·5	9·5	9·4	15·5	15·4
36	14 54·0	14 56·4	14 13·3	3·6	3·6	9·6	9·5	15·6	15·5
37	14 54·3	14 56·7	14 13·5	3·7	3·7	9·7	9·6	15·7	15·6
38	14 54·5	14 56·9	14 13·8	3·8	3·8	9·8	9·7	15·8	15·7
39	14 54·8	14 57·2	14 14·0	3·9	3·9	9·9	9·8	15·9	15·8
40	14 55·0	14 57·5	14 14·2	4·0	4·0	10·0	9·9	16·0	15·9
41	14 55·3	14 57·7	14 14·5	4·1	4·1	10·1	10·0	16·1	16·0
42	14 55·5	14 58·0	14 14·7	4·2	4·2	10·2	10·1	16·2	16·1
43	14 55·8	14 58·2	14 14·9	4·3	4·3	10·3	10·2	16·3	16·2
44	14 56·0	14 58·5	14 15·2	4·4	4·4	10·4	10·3	16·4	16·3
45	14 56·3	14 58·7	14 15·4	4·5	4·5	10·5	10·4	16·5	16·4
46	14 56·5	14 59·0	14 15·7	4·6	4·6	10·6	10·5	16·6	16·5
47	14 56·8	14 59·2	14 15·9	4·7	4·7	10·7	10·6	16·7	16·6
48	14 57·0	14 59·5	14 16·1	4·8	4·8	10·8	10·7	16·8	16·7
49	14 57·3	14 59·7	14 16·4	4·9	4·9	10·9	10·8	16·9	16·8
50	14 57·5	15 00·0	14 16·6	5·0	5·0	11·0	10·9	17·0	16·9
51	14 57·8	15 00·2	14 16·9	5·1	5·1	11·1	11·0	17·1	17·0
52	14 58·0	15 00·5	14 17·1	5·2	5·2	11·2	11·1	17·2	17·1
53	14 58·3	15 00·7	14 17·3	5·3	5·3	11·3	11·2	17·3	17·2
54	14 58·5	15 01·0	14 17·6	5·4	5·4	11·4	11·3	17·4	17·3
55	14 58·8	15 01·2	14 17·8	5·5	5·5	11·5	11·4	17·5	17·4
56	14 59·0	15 01·5	14 18·0	5·6	5·6	11·6	11·5	17·6	17·5
57	14 59·3	15 01·7	14 18·3	5·7	5·7	11·7	11·6	17·7	17·6
58	14 59·5	15 02·0	14 18·5	5·8	5·8	11·8	11·7	17·8	17·7
59	14 59·8	15 02·2	14 18·8	5·9	5·9	11·9	11·8	17·9	17·8
60	15 00·0	15 02·5	14 19·0	6·0	6·0	12·0	11·9	18·0	17·9

TABLAS PARA INTERPOLAR ORTO DE SOL, ORTO DE LUNA, ETC.

TABLA I – POR LATITUD

Intervalo Tabular			Diferencia entre las horas para latitudes consecutivas															
10°	5°	2°	5m	10m	15m	20m	25m	30m	35m	40m	45m	50m	55m	60m	1h 05m	1h 10m	1h 15m	1h 20m
° ′	° ′	° ′	m	m	m	m	m	m	m	m	m	m	m	m	h m	h m	h m	h m
0 30	0 15	0 06	0	0	1	1	1	1	1	2	2	2	2	2	0 02	0 02	0 02	0 02
1 00	0 30	0 12	0	1	1	2	2	3	3	3	4	4	4	5	05	05	05	05
1 30	0 45	0 18	1	1	2	3	3	4	4	5	5	6	7	7	07	07	07	07
2 00	1 00	0 24	1	2	3	4	5	5	6	7	7	8	9	10	10	10	10	10
2 30	1 15	0 30	1	2	4	5	6	7	8	9	9	10	11	12	12	13	13	13
3 00	1 30	0 36	1	3	4	6	7	8	9	10	11	12	13	14	0 15	0 15	0 16	0 16
3 30	1 45	0 42	2	3	5	7	8	10	11	12	13	14	16	17	18	18	19	19
4 00	2 00	0 48	2	4	6	8	9	11	13	14	15	16	18	19	20	21	22	22
4 30	2 15	0 54	2	4	7	9	11	13	15	16	18	19	21	22	23	24	25	26
5 00	2 30	1 00	2	5	7	10	12	14	16	18	20	22	23	25	26	27	28	29
5 30	2 45	1 06	3	5	8	11	13	16	18	20	22	24	26	28	0 29	0 30	0 31	0 32
6 00	3 00	1 12	3	6	9	12	14	17	20	22	24	26	29	31	32	33	34	36
6 30	3 15	1 18	3	6	10	13	16	19	22	24	26	29	31	34	36	37	38	40
7 00	3 30	1 24	3	7	10	14	17	20	23	26	29	31	34	37	39	41	42	44
7 30	3 45	1 30	4	7	11	15	18	22	25	28	31	34	37	40	43	44	46	48
8 00	4 00	1 36	4	8	12	16	20	23	27	30	34	37	41	44	0 47	0 48	0 51	0 53
8 30	4 15	1 42	4	8	13	17	21	25	29	33	36	40	44	48	0 51	0 53	0 56	0 58
9 00	4 30	1 48	4	9	13	18	22	27	31	35	39	43	47	52	0 55	0 58	1 01	1 04
9 30	4 45	1 54	5	9	14	19	24	28	33	38	42	47	51	56	1 00	1 04	1 08	1 12
10 00	5 00	2 00	5	10	15	20	25	30	35	40	45	50	55	60	1 05	1 10	1 15	1 20

La tabla I Es para interpolar el T.M.L. del: orto y crepúsculo del sol, orto de la luna, etc., por latitud. Debe entrarse, en la columna apropiada de la izquierda, con la diferencia entre la latitud verdadera y la latitud tabulada más cercana la cual es *menor* que la latitud verdadera; y con el argumento en la parte superior el cual es el valor más cercano de la diferencia entre las horas para la latitud tabular y la siguiente superior; la corrección así obtenida es aplicada para la hora de la latitud tabular; el signo de la corrección puede determinarse por inspección. Debe notarse que la interpolación no es lineal, así que cuando se usa ésta tabla es esencial tomar el fenómeno tabular para la latitud *menor* que la latitud verdadera.

TABLA II – POR LONGITUD

Long. Este u Oeste	Diferencia entre las horas para la fecha dada y la fecha anterior (para longitudes este) o para la fecha dada y la posterior (para longitudes oeste)																	
	10m	20m	30m	40m	50m	60m	1h + 10m	1h + 20m	1h + 30m	1h + 40m	1h + 50m	1h + 60m	2h 10m	2h 20m	2h 30m	2h 40m	2h 50m	3h 00m
°	m	m	m	m	m	m	m	m	m	m	m	m	h m	h m	h m	h m	h m	h m
0	0	0	0	0	0	0	0	0	0	0	0	0	0 00	0 00	0 00	0 00	0 00	0 00
10	0	1	1	1	1	2	2	2	2	3	3	3	04	04	04	04	05	05
20	1	1	2	2	3	3	4	4	5	6	6	7	07	08	08	09	09	10
30	1	2	2	3	4	5	6	7	7	8	9	10	11	12	12	13	14	15
40	1	2	3	4	6	7	8	9	10	11	12	13	14	16	17	18	19	20
50	1	3	4	6	7	8	10	11	12	14	15	17	0 18	0 19	0 21	0 22	0 24	0 25
60	2	3	5	7	8	10	12	13	15	17	18	20	22	23	25	27	28	30
70	2	4	6	8	10	12	14	16	17	19	21	23	25	27	29	31	33	35
80	2	4	7	9	11	13	16	18	20	22	24	27	29	31	33	36	38	40
90	2	5	7	10	12	15	17	20	22	25	27	30	32	35	37	40	42	45
100	3	6	8	11	14	17	19	22	25	28	31	33	0 36	0 39	0 42	0 44	0 47	0 50
110	3	6	9	12	15	18	21	24	27	31	34	37	40	43	46	49	0 52	0 55
120	3	7	10	13	17	20	23	27	30	33	37	40	43	47	50	53	0 57	1 00
130	4	7	11	14	18	22	25	29	32	36	40	43	47	51	54	0 58	1 01	1 05
140	4	8	12	16	19	23	27	31	35	39	43	47	51	54	0 58	1 02	1 06	1 10
150	4	8	13	17	21	25	29	33	38	42	46	50	0 54	0 58	1 03	1 07	1 11	1 15
160	4	9	13	18	22	27	31	36	40	44	49	53	0 58	1 02	1 07	1 11	1 16	1 20
170	5	9	14	19	24	28	33	38	42	47	52	57	1 01	1 06	1 11	1 16	1 20	1 25
180	5	10	15	20	25	30	35	40	45	50	55	60	1 05	1 10	1 15	1 20	1 25	1 30

La tabla II Es para interpolar el T.M.L. del: orto, ocaso y paso por el meridiano de la Luna, por longitud. Se entra con la longitud y con la diferencia entre las horas para la fecha dada y para la fecha anterior (en longitudes este) o la fecha siguente (en longitudes oeste). La corrección es normalmente *sumada* para longitudes oeste y *restada* para longitudes este, pero sí, como ocurre ocasionalmente, las horas se hacen más temprano cada día en lugar de más tarde, los signos de la corrección deben invertirse.

INDICE DE ESTRELLAS SELECCIONADAS, 2001

Nombre	No.	Mag.	A.H.S.	Dec.
			°	°
Acamar	7	3·1	315	S 40
Achernar	5	0·6	336	S 57
Acrux	30	1·1	173	S 63
Adhara	19	1·6	255	S 29
Aldebaran	10	1·1	291	N 17
Alioth	32	1·7	166	N 56
Alkaid	34	1·9	153	N 49
Al Na'ir	55	2·2	28	S 47
Alnilam	15	1·8	276	S 1
Alphard	25	2·2	218	S 9
Alphecca	41	2·3	126	N 27
Alpheratz	1	2·2	358	N 29
Altair	51	0·9	62	N 9
Ankaa	2	2·4	353	S 42
Antares	42	1·2	113	S 26
Arcturus	37	0·2	146	N 19
Atria	43	1·9	108	S 69
Avior	22	1·7	234	S 60
Bellatrix	13	1·7	279	N 6
Betelgeuse	16	Var.*	271	N 7
Canopus	17	−0·9	264	S 53
Capella	12	0·2	281	N 46
Deneb	53	1·3	50	N 45
Denebola	28	2·2	183	N 15
Diphda	4	2·2	349	S 18
Dubhe	27	2·0	194	N 62
Elnath	14	1·8	278	N 29
Eltanin	47	2·4	91	N 51
Enif	54	2·5	34	N 10
Fomalhaut	56	1·3	16	S 30
Gacrux	31	1·6	172	S 57
Gienah	29	2·8	176	S 18
Hadar	35	0·9	149	S 60
Hamal	6	2·2	328	N 23
Kaus Australis	48	2·0	84	S 34
Kochab	40	2·2	137	N 74
Markab	57	2·6	14	N 15
Menkar	8	2·8	314	N 4
Menkent	36	2·3	148	S 36
Miaplacidus	24	1·8	222	S 70
Mirfak	9	1·9	309	N 50
Nunki	50	2·1	76	S 26
Peacock	52	2·1	54	S 57
Pollux	21	1·2	244	N 28
Procyon	20	0·5	245	N 5
Rasalhague	46	2·1	96	N 13
Regulus	26	1·3	208	N 12
Rigel	11	0·3	281	S 8
Rigil Kentaurus	38	0·1	140	S 61
Sabik	44	2·6	102	S 16
Schedar	3	2·5	350	N 57
Shaula	45	1·7	97	S 37
Sirius	18	−1·6	259	S 17
Spica	33	1·2	159	S 11
Suhail	23	2·2	223	S 43
Vega	49	0·1	81	N 39
Zubenelgenubi	39	2·9	137	S 16

No.	Nombre	Mag.	A.H.S.	Dec.
			°	°
1	*Alpheratz*	2·2	358	N 29
2	*Ankaa*	2·4	353	S 42
3	*Schedar*	2·5	350	N 57
4	*Diphda*	2·2	349	S 18
5	*Achernar*	0·6	336	S 57
6	*Hamal*	2·2	328	N 23
7	*Acamar*	3·1	315	S 40
8	*Menkar*	2·8	314	N 4
9	*Mirfak*	1·9	309	N 50
10	*Aldebaran*	1·1	291	N 17
11	*Rigel*	0·3	281	S 8
12	*Capella*	0·2	281	N 46
13	*Bellatrix*	1·7	279	N 6
14	*Elnath*	1·8	278	N 29
15	*Alnilam*	1·8	276	S 1
16	*Betelgeuse*	Var.*	271	N 7
17	*Canopus*	−0·9	264	S 53
18	*Sirius*	−1·6	259	S 17
19	*Adhara*	1·6	255	S 29
20	*Procyon*	0·5	245	N 5
21	*Pollux*	1·2	244	N 28
22	*Avior*	1·7	234	S 60
23	*Suhail*	2·2	223	S 43
24	*Miaplacidus*	1·8	222	S 70
25	*Alphard*	2·2	218	S 9
26	*Regulus*	1·3	208	N 12
27	*Dubhe*	2·0	194	N 62
28	*Denebola*	2·2	183	N 15
29	*Gienah*	2·8	176	S 18
30	*Acrux*	1·1	173	S 63
31	*Gacrux*	1·6	172	S 57
32	*Alioth*	1·7	166	N 56
33	*Spica*	1·2	159	S 11
34	*Alkaid*	1·9	153	N 49
35	*Hadar*	0·9	149	S 60
36	*Menkent*	2·3	148	S 36
37	*Arcturus*	0·2	146	N 19
38	*Rigil Kentaurus*	0·1	140	S 61
39	*Zubenelgenubi*	2·9	137	S 16
40	*Kochab*	2·2	137	N 74
41	*Alphecca*	2·3	126	N 27
42	*Antares*	1·2	113	S 26
43	*Atria*	1·9	108	S 69
44	*Sabik*	2·6	102	S 16
45	*Shaula*	1·7	97	S 37
46	*Rasalhague*	2·1	96	N 13
47	*Eltanin*	2·4	91	N 51
48	*Kaus Australis*	2·0	84	S 34
49	*Vega*	0·1	81	N 39
50	*Nunki*	2·1	76	S 26
51	*Altair*	0·9	62	N 9
52	*Peacock*	2·1	54	S 57
53	*Deneb*	1·3	50	N 45
54	*Enif*	2·5	34	N 10
55	*Al Na'ir*	2·2	28	S 47
56	*Fomalhaut*	1·3	16	S 30
57	*Markab*	2·6	14	N 15

*0·1 — 1·2

TABLAS DE CORRECCION DE ALTURA 0° – 35° – LUNA

Alt. Ap.	0°–4° Corrⁿ	5°–9° Corrⁿ	10°–14° Corrⁿ	15°–19° Corrⁿ	20°–24° Corrⁿ	25°–29° Corrⁿ	30°–34° Corrⁿ	Alt. Ap.
′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	′
00	0 33·8	5 58·2	10 62·1	15 62·8	20 62·2	25 60·8	30 58·9	00
10	35·9	58·5	62·2	62·8	62·1	60·8	58·8	10
20	37·8	58·7	62·2	62·8	62·1	60·7	58·8	20
30	39·6	58·9	62·3	62·8	62·1	60·7	58·7	30
40	41·2	59·1	62·3	62·8	62·0	60·6	58·6	40
50	42·6	59·3	62·4	62·7	62·0	60·6	58·5	50
00	1 44·0	6 59·5	11 62·4	16 62·7	21 62·0	26 60·5	31 58·5	00
10	45·2	59·7	62·4	62·7	61·9	60·4	58·4	10
20	46·3	59·9	62·5	62·7	61·9	60·4	58·3	20
30	47·3	60·0	62·5	62·7	61·9	60·3	58·2	30
40	48·3	60·2	62·5	62·7	61·8	60·3	58·2	40
50	49·2	60·3	62·6	62·7	61·8	60·2	58·1	50
00	2 50·0	7 60·5	12 62·6	17 62·7	22 61·7	27 60·1	32 58·0	00
10	50·8	60·6	62·6	62·6	61·7	60·1	57·9	10
20	51·4	60·7	62·6	62·6	61·6	60·0	57·8	20
30	52·1	60·9	62·7	62·6	61·6	59·9	57·8	30
40	52·7	61·0	62·7	62·6	61·5	59·9	57·7	40
50	53·3	61·1	62·7	62·6	61·5	59·8	57·6	50
00	3 53·8	8 61·2	13 62·7	18 62·5	23 61·5	28 59·7	33 57·5	00
10	54·3	61·3	62·7	62·5	61·4	59·7	57·4	10
20	54·8	61·4	62·7	62·5	61·4	59·6	57·4	20
30	55·2	61·5	62·8	62·5	61·3	59·6	57·3	30
40	55·6	61·6	62·8	62·4	61·3	59·5	57·2	40
50	56·0	61·6	62·8	62·4	61·2	59·4	57·1	50
00	4 56·4	9 61·7	14 62·8	19 62·4	24 61·2	29 59·3	34 57·0	00
10	56·7	61·8	62·8	62·3	61·1	59·3	56·9	10
20	57·1	61·9	62·8	62·3	61·1	59·2	56·9	20
30	57·4	61·9	62·8	62·3	61·0	59·1	56·8	30
40	57·7	62·0	62·8	62·2	60·9	59·1	56·7	40
50	57·9	62·1	62·8	62·2	60·9	59·0	56·6	50

P.H.	I	S	I	S	I	S	I	S	I	S	I	S	I	S	P.H.
′	′	′	′	′	′	′	′	′	′	′	′	′	′	′	′
54·0	0·3	0·9	0·3	0·9	0·4	1·0	0·5	1·1	0·6	1·2	0·7	1·3	0·9	1·5	54·0
54·3	0·7	1·1	0·7	1·2	0·7	1·2	0·8	1·3	0·9	1·4	1·1	1·5	1·2	1·7	54·3
54·6	1·1	1·4	1·1	1·4	1·1	1·4	1·2	1·5	1·3	1·6	1·4	1·7	1·5	1·8	54·6
54·9	1·4	1·6	1·5	1·6	1·5	1·6	1·6	1·7	1·6	1·8	1·8	1·9	1·9	2·0	54·9
55·2	1·8	1·8	1·8	1·8	1·9	1·9	1·9	1·9	2·0	2·0	2·1	2·1	2·2	2·2	55·2
55·5	2·2	2·0	2·2	2·0	2·3	2·1	2·3	2·1	2·4	2·2	2·4	2·3	2·5	2·4	55·5
55·8	2·6	2·2	2·6	2·2	2·6	2·3	2·7	2·3	2·7	2·4	2·8	2·4	2·9	2·5	55·8
56·1	3·0	2·4	3·0	2·5	3·0	2·5	3·0	2·5	3·1	2·6	3·1	2·6	3·2	2·7	56·1
56·4	3·4	2·7	3·4	2·7	3·4	2·7	3·4	2·7	3·4	2·8	3·5	2·8	3·5	2·9	56·4
56·7	3·7	2·9	3·7	2·9	3·8	2·9	3·8	2·9	3·8	3·0	3·8	3·0	3·9	3·0	56·7
57·0	4·1	3·1	4·1	3·1	4·1	3·1	4·1	3·1	4·2	3·1	4·2	3·2	4·2	3·2	57·0
57·3	4·5	3·3	4·5	3·3	4·5	3·3	4·5	3·3	4·5	3·3	4·5	3·4	4·6	3·4	57·3
57·6	4·9	3·5	4·9	3·5	4·9	3·5	4·9	3·5	4·9	3·5	4·9	3·5	4·9	3·6	57·6
57·9	5·3	3·8	5·3	3·8	5·2	3·8	5·2	3·7	5·2	3·7	5·2	3·7	5·2	3·7	57·9
58·2	5·6	4·0	5·6	4·0	5·6	4·0	5·6	4·0	5·6	3·9	5·6	3·9	5·6	3·9	58·2
58·5	6·0	4·2	6·0	4·2	6·0	4·2	6·0	4·2	6·0	4·1	5·9	4·1	5·9	4·1	58·5
58·8	6·4	4·4	6·4	4·4	6·4	4·4	6·4	4·4	6·3	4·3	6·3	4·3	6·2	4·2	58·8
59·1	6·8	4·6	6·8	4·6	6·7	4·6	6·7	4·6	6·7	4·5	6·6	4·5	6·6	4·4	59·1
59·4	7·2	4·8	7·1	4·8	7·1	4·8	7·1	4·8	7·0	4·7	7·0	4·7	6·9	4·6	59·4
59·7	7·5	5·1	7·5	5·0	7·5	5·0	7·5	5·0	7·4	4·9	7·3	4·8	7·2	4·7	59·7
60·0	7·9	5·3	7·9	5·3	7·9	5·2	7·8	5·2	7·8	5·1	7·7	5·0	7·6	4·9	60·0
60·3	8·3	5·5	8·3	5·5	8·2	5·4	8·2	5·4	8·1	5·3	8·0	5·2	7·9	5·1	60·3
60·6	8·7	5·7	8·7	5·7	8·6	5·7	8·6	5·6	8·5	5·5	8·4	5·4	8·2	5·3	60·6
60·9	9·1	5·9	9·0	5·9	9·0	5·9	8·9	5·8	8·8	5·7	8·7	5·6	8·6	5·4	60·9
61·2	9·5	6·2	9·4	6·1	9·4	6·1	9·3	6·0	9·2	5·9	9·1	5·8	8·9	5·6	61·2
61·5	9·8	6·4	9·8	6·3	9·7	6·3	9·7	6·2	9·5	6·1	9·4	5·9	9·2	5·8	61·5

DEPRESION			
Alt. del ojo	Corrⁿ	Alt. del ojo	Alt. del ojo	Corrⁿ	Alt. del ojo
m		pies	m		pies
2·4	′ 2·8	8·0	9·5	′ 5·5	31·5
2·6	2·9	8·6	9·9	5·6	32·7
2·8	3·0	9·2	10·3	5·7	33·9
3·0	3·1	9·8	10·6	5·8	35·1
3·2	3·2	10·5	11·0	5·9	36·3
3·4	3·3	11·2	11·4	6·0	37·6
3·6	3·4	11·9	11·8	6·1	38·9
3·8	3·5	12·6	12·2	6·2	40·1
4·0	3·6	13·3	12·6	6·3	41·5
4·3	3·7	14·1	13·0	6·4	42·8
4·5	3·8	14·9	13·4	6·5	44·2
4·7	3·9	15·7	13·8	6·6	45·5
5·0	4·0	16·5	14·2	6·7	46·9
5·2	4·1	17·4	14·7	6·8	48·4
5·5	4·2	18·3	15·1	6·9	49·8
5·8	4·3	19·1	15·5	7·0	51·3
6·1	4·4	20·1	16·0	7·1	52·8
6·3	4·5	21·0	16·5	7·2	54·3
6·6	4·6	22·0	16·9	7·3	55·8
6·9	4·7	22·9	17·4	7·4	57·4
7·2	4·8	23·9	17·9	7·5	58·9
7·5	4·9	24·9	18·4	7·6	60·5
7·9	5·0	26·0	18·8	7·7	62·1
8·2	5·1	27·1	19·3	7·8	63·8
8·5	5·2	28·1	19·8	7·9	65·4
8·8	5·3	29·2	20·4	8·0	67·1
9·2	5·4	30·4	20·9	8·1	68·8
9·5		31·5	21·4		70·5

TABLA DE CORRECCION DE LUNA

La corrección está dividida en dos partes; la primera corrección se toma de la parte superior de la tabla usando la altura aparente como argumento, y la segunda de la parte inferior, usando P.H. como argumento, en la misma columna que se usó para tomar la primera corrección. En la parte inferior se dan correcciones separadas para los limbos inferior (I) y superior (S). Todas las correcciones deben **sumarse** a la altura aparente, *pero deben restarse* 30′ *de la altura correspondiente al limbo superior.*

Para correcciones por depresión y temperatura ver página A_4.

Para observaciones con sextante de burbuja ignorar la depresión, tomar la media de las correcciones para limbo superior y limbo inferior y restar 15′ de la altura.

Alt. Ap. = Altura Aparente = Altura de sextante corregida por error de índice y depresión.

TABLAS DE CORRECCION DE ALTURA 35° – 90° – LUNA

Alt. Ap.	35°–39° Corrⁿ	40°–44° Corrⁿ	45°–49° Corrⁿ	50°–54° Corrⁿ	55°–59° Corrⁿ	60°–64° Corrⁿ	65°–69° Corrⁿ	70°–74° Corrⁿ	75°–79° Corrⁿ	80°–84° Corrⁿ	85°–89° Corrⁿ	Alt. Ap.
′	° ′ ′	° ′ ′	° ′ ′	° ′ ′	° ′ ′	° ′ ′	° ′ ′	° ′ ′	° ′ ′	° ′ ′	° ′ ′	′
00	35 56·5	40 53·7	45 50·5	50 46·9	55 43·1	60 38·9	65 34·6	70 30·1	75 25·3	80 20·5	85 15·6	00
10	56·4	53·6	50·4	46·8	42·9	38·8	34·4	29·9	25·2	20·4	15·5	10
20	56·3	53·5	50·2	46·7	42·8	38·7	34·3	29·7	25·0	20·2	15·3	20
30	56·2	53·4	50·1	46·5	42·7	38·5	34·1	29·6	24·9	20·0	15·1	30
40	56·2	53·3	50·0	46·4	42·5	38·4	34·0	29·4	24·7	19·9	15·0	40
50	56·1	53·2	49·9	46·3	42·4	38·2	33·8	29·3	24·5	19·7	14·8	50
00	36 56·0	41 53·1	46 49·8	51 46·2	56 42·3	61 38·1	66 33·7	71 29·1	76 24·4	81 19·6	86 14·6	00
10	55·9	53·0	49·7	46·0	42·1	37·9	33·5	29·0	24·2	19·4	14·5	10
20	55·8	52·8	49·5	45·9	42·0	37·8	33·4	28·8	24·1	19·2	14·3	20
30	55·7	52·7	49·4	45·8	41·8	37·7	33·2	28·7	23·9	19·1	14·1	30
40	55·6	52·6	49·3	45·7	41·7	37·5	33·1	28·5	23·8	18·9	14·0	40
50	55·5	52·5	49·2	45·5	41·6	37·4	32·9	28·3	23·6	18·7	13·8	50
00	37 55·4	42 52·4	47 49·1	52 45·4	57 41·4	62 37·2	67 32·8	72 28·2	77 23·4	82 18·6	87 13·7	00
10	55·3	52·3	49·0	45·3	41·3	37·1	32·6	28·0	23·3	18·4	13·5	10
20	55·2	52·2	48·8	45·2	41·2	36·9	32·5	27·9	23·1	18·2	13·3	20
30	55·1	52·1	48·7	45·0	41·0	36·8	32·3	27·7	22·9	18·1	13·2	30
40	55·0	52·0	48·6	44·9	40·9	36·6	32·2	27·6	22·8	17·9	13·0	40
50	55·0	51·9	48·5	44·8	40·8	36·5	32·0	27·4	22·6	17·8	12·8	50
00	38 54·9	43 51·8	48 48·4	53 44·6	58 40·6	63 36·4	68 31·9	73 27·2	78 22·5	83 17·6	88 12·7	00
10	54·8	51·7	48·2	44·5	40·5	36·2	31·7	27·1	22·3	17·4	12·5	10
20	54·7	51·6	48·1	44·4	40·3	36·1	31·6	26·9	22·1	17·3	12·3	20
30	54·6	51·5	48·0	44·2	40·2	35·9	31·4	26·8	22·0	17·1	12·2	30
40	54·5	51·4	47·9	44·1	40·1	35·8	31·3	26·6	21·8	16·9	12·0	40
50	54·4	51·2	47·8	44·0	39·9	35·6	31·1	26·5	21·7	16·8	11·8	50
00	39 54·3	44 51·1	49 47·6	54 43·9	59 39·8	64 35·5	69 31·0	74 26·3	79 21·5	84 16·6	89 11·7	00
10	54·2	51·0	47·5	43·7	39·6	35·3	30·8	26·1	21·3	16·5	11·5	10
20	54·1	50·9	47·4	43·6	39·5	35·2	30·7	26·0	21·2	16·3	11·4	20
30	54·0	50·8	47·3	43·5	39·4	35·0	30·5	25·8	21·0	16·1	11·2	30
40	53·9	50·7	47·2	43·3	39·2	34·9	30·4	25·7	20·9	16·0	11·0	40
50	53·8	50·6	47·0	43·2	39·1	34·7	30·2	25·5	20·7	15·8	10·9	50

P.H.	I S	I S	I S	I S	I S	I S	I S	I S	I S	I S	I S	P.H
′	′ ′	′ ′	′ ′	′ ′	′ ′	′ ′	′ ′	′ ′	′ ′	′ ′	′ ′	′
54·0	1·1 1·7	1·3 1·9	1·5 2·1	1·7 2·4	2·0 2·6	2·3 2·9	2·6 3·2	2·9 3·5	3·2 3·8	3·5 4·1	3·8 4·5	54·0
54·3	1·4 1·8	1·6 2·0	1·8 2·2	2·0 2·5	2·3 2·7	2·5 3·0	2·8 3·2	3·0 3·5	3·3 3·8	3·6 4·1	3·9 4·4	54·3
54·6	1·7 2·0	1·9 2·2	2·1 2·4	2·3 2·6	2·5 2·8	2·7 3·0	3·0 3·3	3·2 3·5	3·5 3·8	3·7 4·1	4·0 4·3	54·6
54·9	2·0 2·2	2·2 2·3	2·3 2·5	2·5 2·7	2·7 2·9	2·9 3·1	3·2 3·3	3·4 3·5	3·6 3·8	3·9 4·0	4·1 4·3	54·9
55·2	2·3 2·3	2·5 2·4	2·6 2·6	2·8 2·8	3·0 2·9	3·2 3·1	3·4 3·3	3·6 3·5	3·8 3·7	4·0 4·0	4·2 4·2	55·2
55·5	2·7 2·5	2·8 2·6	2·9 2·7	3·1 2·9	3·2 3·0	3·4 3·2	3·6 3·4	3·7 3·5	3·9 3·7	4·1 3·9	4·3 4·1	55·5
55·8	3·0 2·6	3·1 2·7	3·2 2·8	3·3 3·0	3·5 3·1	3·6 3·3	3·8 3·4	3·9 3·6	4·1 3·7	4·2 3·9	4·4 4·0	55·8
56·1	3·3 2·8	3·4 2·9	3·5 3·0	3·6 3·1	3·7 3·2	3·8 3·3	4·0 3·4	4·1 3·6	4·2 3·7	4·4 3·8	4·5 4·0	56·1
56·4	3·6 2·9	3·7 3·0	3·8 3·1	3·9 3·2	3·9 3·3	4·0 3·4	4·1 3·5	4·3 3·6	4·4 3·7	4·5 3·8	4·6 3·9	56·4
56·7	3·9 3·1	4·0 3·1	4·1 3·2	4·1 3·3	4·2 3·3	4·3 3·4	4·3 3·5	4·4 3·6	4·5 3·7	4·6 3·8	4·7 3·8	56·7
57·0	4·3 3·2	4·3 3·3	4·3 3·3	4·4 3·4	4·4 3·4	4·5 3·5	4·5 3·5	4·6 3·6	4·7 3·6	4·7 3·7	4·8 3·8	57·0
57·3	4·6 3·4	4·6 3·4	4·6 3·4	4·6 3·5	4·7 3·5	4·7 3·5	4·7 3·6	4·8 3·6	4·8 3·6	4·8 3·7	4·9 3·7	57·3
57·6	4·9 3·6	4·9 3·6	4·9 3·6	4·9 3·6	4·9 3·6	4·9 3·6	4·9 3·6	4·9 3·6	5·0 3·6	5·0 3·6	5·0 3·6	57·6
57·9	5·2 3·7	5·2 3·7	5·2 3·7	5·2 3·7	5·2 3·7	5·1 3·6	5·1 3·6	5·1 3·6	5·1 3·6	5·1 3·6	5·1 3·6	57·9
58·2	5·5 3·9	5·5 3·8	5·5 3·8	5·4 3·8	5·4 3·7	5·4 3·7	5·3 3·7	5·3 3·6	5·2 3·6	5·2 3·5	5·2 3·5	58·2
58·5	5·9 4·0	5·8 4·0	5·8 3·9	5·7 3·9	5·6 3·8	5·6 3·8	5·5 3·7	5·5 3·6	5·4 3·6	5·3 3·5	5·3 3·4	58·5
58·8	6·2 4·2	6·1 4·1	6·0 4·1	6·0 4·0	5·9 3·9	5·8 3·8	5·7 3·7	5·6 3·6	5·5 3·5	5·4 3·5	5·3 3·4	58·8
59·1	6·5 4·3	6·4 4·3	6·3 4·2	6·2 4·1	6·1 4·0	6·0 3·9	5·9 3·8	5·8 3·6	5·7 3·5	5·6 3·4	5·4 3·3	59·1
59·4	6·8 4·5	6·7 4·4	6·6 4·3	6·5 4·2	6·4 4·1	6·2 3·9	6·1 3·8	6·0 3·7	5·8 3·5	5·7 3·4	5·5 3·2	59·4
59·7	7·1 4·6	7·0 4·5	6·9 4·4	6·8 4·3	6·6 4·1	6·5 4·0	6·3 3·8	6·2 3·7	6·0 3·5	5·8 3·3	5·6 3·2	59·7
60·0	7·5 4·8	7·3 4·7	7·2 4·5	7·0 4·4	6·9 4·2	6·7 4·0	6·5 3·9	6·3 3·7	6·1 3·5	5·9 3·3	5·7 3·1	60·0
60·3	7·8 5·0	7·6 4·8	7·5 4·7	7·3 4·5	7·1 4·3	6·9 4·1	6·7 3·9	6·5 3·7	6·3 3·5	6·0 3·2	5·8 3·0	60·3
60·6	8·1 5·1	7·9 5·0	7·7 4·8	7·6 4·6	7·3 4·4	7·1 4·2	6·9 3·9	6·7 3·7	6·4 3·4	6·2 3·2	5·9 2·9	60·6
60·9	8·4 5·3	8·2 5·1	8·0 4·9	7·8 4·7	7·6 4·5	7·3 4·2	7·1 4·0	6·8 3·7	6·6 3·4	6·3 3·2	6·0 2·9	60·9
61·2	8·7 5·4	8·5 5·2	8·3 5·0	8·1 4·8	7·8 4·5	7·6 4·3	7·3 4·0	7·0 3·7	6·7 3·4	6·4 3·1	6·1 2·8	61·2
61·5	9·1 5·6	8·8 5·4	8·6 5·1	8·3 4·9	8·1 4·6	7·8 4·3	7·5 4·0	7·2 3·7	6·9 3·4	6·5 3·1	6·2 2·7	61·5