## STARS AND PLANETS

| App Alt. | Corrⁿ |
|---|---|
| ° ′ | ′ |
| 9 55 | −5·3 |
| 10 07 | −5·2 |
| 10 20 | −5·1 |
| 10 32 | −5·0 |
| 10 46 | −4·9 |
| 10 59 | −4·8 |
| 11 14 | −4·7 |
| 11 29 | −4·6 |
| 11 44 | −4·5 |
| 12 00 | −4·4 |
| 12 17 | −4·3 |
| 12 35 | −4·2 |
| 12 53 | −4·1 |
| 13 12 | −4·0 |
| 13 32 | −3·9 |
| 13 53 | −3·8 |
| 14 16 | −3·7 |
| 14 39 | −3·6 |
| 15 03 | −3·5 |
| 15 29 | −3·4 |
| 15 56 | −3·3 |
| 16 25 | −3·2 |
| 16 55 | −3·1 |
| 17 27 | −3·0 |
| 18 01 | −2·9 |
| 18 37 | −2·8 |
| 19 16 | −2·7 |
| 19 56 | −2·6 |
| 20 40 | −2·5 |
| 21 27 | −2·4 |
| 22 17 | −2·3 |
| 23 11 | −2·2 |
| 24 09 | −2·1 |
| 25 12 | −2·0 |
| 26 20 | −1·9 |
| 27 34 | −1·8 |
| 28 54 | −1·7 |
| 30 22 | −1·6 |
| 31 58 | −1·5 |
| 33 43 | −1·4 |
| 35 38 | −1·3 |
| 37 45 | −1·2 |
| 40 06 | −1·1 |
| 42 42 | −1·0 |
| 45 34 | −0·9 |
| 48 45 | −0·8 |
| 52 16 | −0·7 |
| 56 09 | −0·6 |
| 60 26 | −0·5 |
| 65 06 | −0·4 |
| 70 09 | −0·3 |
| 75 32 | −0·2 |
| 81 12 | −0·1 |
| 87 03 | 0·0 |
| 90 00 | |

| App. Alt. | Additional Corrⁿ |
|---|---|
| | **2012** |
| | **VENUS** |
| | Jan. 1–Feb. 20 |
| | Sept. 20–Dec. 31 |
| ° | ′ |
| 0 | +0·1 |
| 60 | |
| | Feb. 21–Apr. 12 |
| | July 31–Sept. 19 |
| ° | ′ |
| 0 | +0·2 |
| 41 | +0·1 |
| 76 | |
| | Apr. 13–May 4 |
| | July 9–July 30 |
| ° | ′ |
| 0 | +0·3 |
| 34 | +0·2 |
| 60 | +0·1 |
| 80 | |
| | May 5–May 21 |
| | June 22–July 8 |
| ° | ′ |
| 0 | +0·4 |
| 29 | +0·3 |
| 51 | +0·2 |
| 68 | +0·1 |
| 83 | |
| | May 22–June 21 |
| ° | ′ |
| 0 | +0·5 |
| 26 | +0·4 |
| 46 | +0·3 |
| 60 | +0·2 |
| 73 | +0·1 |
| 84 | |
| | **MARS** |
| | Jan. 1–Jan. 8 |
| | May 6–Dec. 31 |
| ° | ′ |
| 0 | +0·1 |
| 60 | |
| | Jan. 9–May 5 |
| ° | ′ |
| 0 | +0·2 |
| 41 | +0·1 |
| 76 | |

## DIP

| Ht. of Eye | Corrⁿ | Ht. of Eye | Ht. of Eye | Corrⁿ |
|---|---|---|---|---|
| m | ′ | ft. | 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 | See table | |
| 3·6 | −3·4 | 11·9 | ← | |
| 3·8 | −3·5 | 12·6 | m | ′ |
| 4·0 | −3·6 | 13·3 | 20 – | 7·9 |
| 4·3 | −3·7 | 14·1 | 22 – | 8·3 |
| 4·5 | −3·8 | 14·9 | 24 – | 8·6 |
| 4·7 | −3·9 | 15·7 | 26 – | 9·0 |
| 5·0 | −4·0 | 16·5 | 28 – | 9·3 |
| 5·2 | −4·1 | 17·4 | | |
| 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 | | |
| 7·2 | −4·8 | 23·9 | 40 – | 11·1 |
| 7·5 | −4·9 | 24·9 | 42 – | 11·4 |
| 7·9 | −5·0 | 26·0 | 44 – | 11·7 |
| 8·2 | −5·1 | 27·1 | 46 – | 11·9 |
| 8·5 | −5·2 | 28·1 | 48 – | 12·2 |
| 8·8 | −5·3 | 29·2 | | |
| 9·2 | −5·4 | 30·4 | ft. | ′ |
| 9·5 | −5·5 | 31·5 | 2 – | 1·4 |
| 9·9 | −5·6 | 32·7 | 4 – | 1·9 |
| 10·3 | −5·7 | 33·9 | 6 – | 2·4 |
| 10·6 | −5·8 | 35·1 | 8 – | 2·7 |
| 11·0 | −5·9 | 36·3 | 10 – | 3·1 |
| 11·4 | −6·0 | 37·6 | See table | |
| 11·8 | −6·1 | 38·9 | ← | |
| 12·2 | −6·2 | 40·1 | ft. | ′ |
| 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 | | |
| 15·5 | −7·0 | 51·3 | 100 – | 9·7 |
| 16·0 | −7·1 | 52·8 | 105 – | 9·9 |
| 16·5 | −7·2 | 54·3 | 110 – | 10·2 |
| 16·9 | −7·3 | 55·8 | 115 – | 10·4 |
| 17·4 | −7·4 | 57·4 | 120 – | 10·6 |
| 17·9 | −7·5 | 58·9 | 125 – | 10·8 |
| 18·4 | −7·6 | 60·5 | | |
| 18·8 | −7·7 | 62·1 | 130 – | 11·1 |
| 19·3 | −7·8 | 63·8 | 135 – | 11·3 |
| 19·8 | −7·9 | 65·4 | 140 – | 11·5 |
| 20·4 | −8·0 | 67·1 | 145 – | 11·7 |
| 20·9 | −8·1 | 68·8 | 150 – | 11·9 |
| 21·4 | | 70·5 | 155 – | 12·1 |

## STARS

| Name | SHA | Dec |
|---|---|---|
| | ° ′ | ° ′ |
| Acamar | 315 19.1 | S40 15.1 |
| Achernar | 335 27.4 | S57 10.1 |
| Acrux | 173 10.0 | S63 10.5 |
| Adhara | 255 13.4 | S28 59.5 |
| Aldebaran | 290 50.4 | N16 31.9 |
| Alioth | 166 21.2 | N55 53.7 |
| Alkaid | 152 59.3 | N49 15.3 |
| Al Na'ir | 27 44.3 | S46 53.7 |
| Alnilam | 275 47.4 | S 1 11.7 |
| Alphard | 217 57.0 | S 8 42.9 |
| Alphecca | 126 11.3 | N26 40.5 |
| Alpheratz | 357 44.1 | N29 09.5 |
| Altair | 62 08.6 | N 8 54.2 |
| Ankaa | 353 16.3 | S42 14.0 |
| Antares | 112 26.7 | S26 27.6 |
| Arcturus | 145 56.2 | N19 07.1 |
| Atria | 107 28.6 | S69 03.0 |
| Avior | 234 18.9 | S59 33.2 |
| Bellatrix | 278 33.0 | N 6 21.6 |
| Betelgeuse | 271 02.3 | N 7 24.4 |
| Canopus | 263 57.0 | S52 42.2 |
| Capella | 280 35.9 | N46 00.4 |
| Deneb | 49 31.5 | N45 19.5 |
| Denebola | 182 34.4 | N14 30.1 |
| Diphda | 348 56.6 | S17 54.9 |
| Dubhe | 193 52.8 | N61 41.2 |
| Elnath | 278 13.8 | N28 36.9 |
| Eltanin | 90 45.9 | N51 29.4 |
| Enif | 33 47.5 | N 9 56.1 |
| Fomalhaut | 15 24.5 | S29 33.1 |
| Gacrux | 172 01.6 | S57 11.3 |
| Gienah | 175 53.0 | S17 36.9 |
| Hadar | 148 48.5 | S60 26.3 |
| Hamal | 328 01.6 | N23 31.2 |
| Kaus Aust. | 83 44.3 | S34 22.6 |
| Kochab | 137 19.3 | N74 06.5 |
| Markab | 13 38.9 | N15 16.4 |
| Menkar | 314 15.9 | N 4 08.3 |
| Menkent | 148 08.2 | S36 26.1 |
| Miaplacidus | 221 40.5 | S69 46.5 |
| Mirfak | 308 41.6 | N49 54.1 |
| Nunki | 75 58.8 | S26 16.7 |
| Peacock | 53 19.7 | S56 41.4 |
| Pollux | 243 28.9 | N27 59.7 |
| Procyon | 245 00.7 | N 5 11.4 |
| Rasalhague | 96 06.7 | N12 33.2 |
| Regulus | 207 44.4 | N11 54.3 |
| Rigel | 281 13.0 | S 8 11.3 |
| Rigil Kent. | 139 52.3 | S60 53.4 |
| Sabik | 102 13.0 | S15 44.3 |
| Schedar | 349 41.3 | N56 36.2 |
| Shaula | 96 22.4 | S37 06.7 |
| Sirius | 258 34.6 | S16 44.1 |
| Spica | 158 31.9 | S11 13.7 |
| Suhail | 222 53.3 | S43 29.3 |
| Vega | 80 39.0 | N38 47.9 |
| Zuben'ubi | 137 05.9 | S16 05.7 |

2012

GHA ♈
01/01/2012
0000 UT:
100° 03.9’

Daily Inc.:
+0° 59.2’

Hourly Inc.:
+15° 02.5’

BYGRAVE INSTRUCTIONAL FORM

Special rules:

If H is less than 1° or greater than 89° then choose a different assumed longitude to bring H within the range of the scales.

If declination is less than 1° omit the first step and set W equal to declination. If latitude is also less than 1° then assume a latitude of 1°. Compute Az and Zn. Interchange declination and latitude then start over again computing Hc using those values and disregard the Az derived during this second computation.

If Y is less than 1° or greater than 89° choose a different assumed latitude to bring Y within the range of the scales.

Compute Az. If Az is greater than 85° use this Az for computing Zn and for plotting the LOP. Interchange declination and latitude then start over again computing Hc using those values and disregard the Az derived during this second computation.

0 < LHA < 90 < LHA < 180 < LHA < 270 < LHA < 360

H = LHA ____ | - LHA ____ | 180 - LHA ____ | 360 - LHA ____

H = ____ | H = ____ | H = ____ | H = ____

( If H < 1° or if H > 89° see special rules )

| | | | | |
|---|---|---|---|---|
| X = Co-Lat + or - W: | | | | |
| Declination same name: | + W | -W | - W | + W |
| Declination contrary name: | - W | - W | -W | - W |

D ____ Cos ____ Co-Tan

(If declination is less than 1° see special rules)

H ____ Set 0 Set D Read W

(90) (89:60) Lat – Co-Lat. W ( +/- ) ____

(179:60) Set W Set H Set Y Read Az

X ____ (Ignore sign of X)
( If X < 90 then Y=X ; If X > 90 then Y = 180-X )

Y ____ (Ignore sign of Y)
(If 1° > Y > 89° choose a different assumed latitude)

Set Az Set Y Set 0 Read Hc

(180) (179:60) (360) (359:60)

Az ____
(If Az > 85° see special rules)

Azimuth Rules
North Latitude
0 < LHA < 180 180 < LHA < 360
If DEC or W > LAT Zn = Az Zn = Az
If DEC contrary or W < LAT Zn = 180 + Az Zn = 180 - Az

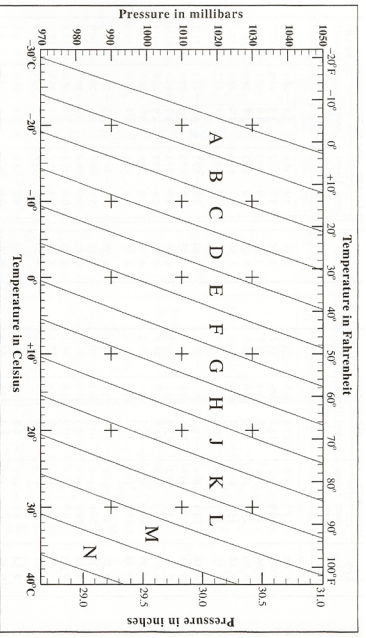
Zn ____

South Latitude
If DEC or W > LAT Zn = 180 + Az Zn = 180 - Az
If DEC contrary or W < LAT Zn = 360 - Az Zn = Az

Hc ____

Ho ____

INT ____ T/A




| App. Alt. | A | B | C | D | E | F | G | H | J | K | L | M | N | P | App. Alt. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ° ′ | ′ | ′ | ′ | ′ | ′ | ′ | ′ | ′ | ′ | ′ | ′ | ′ | ′ | ′ | ° ′ |
| 00 00 | −7·3 | −5·9 | −4·6 | −3·4 | −2·2 | −1·1 | 0·0 | +1·0 | +2·0 | +3·0 | +4·0 | +4·9 | +5·9 | +6·9 | 00 00 |
| 00 30 | 4·5 | 3·5 | 2·6 | 1·7 | 0·8 | 0·0 | 0·8 | 1·6 | 2·3 | 3·1 | 3·8 | 4·5 | 5·3 | 6·0 | 00 30 |
| 01 00 | 3·5 | 2·8 | 2·0 | 1·3 | 0·7 | 0·0 | 0·6 | 1·2 | 1·8 | 2·4 | 3·0 | 3·6 | 4·2 | 4·8 | 01 00 |
| 01 30 | 2·8 | 2·2 | 1·7 | 1·1 | 0·5 | 0·0 | 0·5 | 1·0 | 1·5 | 2·0 | 2·5 | 2·9 | 3·4 | 3·9 | 01 30 |
| 02 00 | 2·3 | 1·9 | 1·4 | 0·9 | 0·4 | 0·0 | 0·4 | 0·8 | 1·3 | 1·7 | 2·0 | 2·4 | 2·8 | 3·2 | 02 00 |
| 02 30 | −2·0 | −1·6 | −1·2 | −0·8 | −0·4 | 0·0 | +0·4 | +0·7 | +1·1 | +1·4 | +1·7 | +2·1 | +2·4 | +2·7 | 02 30 |
| 03 00 | 1·7 | 1·4 | 1·0 | 0·7 | 0·3 | 0·0 | 0·3 | 0·6 | 0·9 | 1·2 | 1·5 | 1·8 | 2·1 | 2·4 | 03 00 |
| 03 30 | 1·5 | 1·2 | 0·9 | 0·6 | 0·3 | 0·0 | 0·3 | 0·5 | 0·8 | 1·1 | 1·3 | 1·6 | 1·8 | 2·1 | 03 30 |
| 04 00 | 1·3 | 1·1 | 0·8 | 0·5 | 0·3 | 0·0 | 0·2 | 0·5 | 0·7 | 0·9 | 1·2 | 1·4 | 1·6 | 1·9 | 04 00 |
| 04 30 | 1·2 | 0·9 | 0·7 | 0·5 | 0·2 | 0·0 | 0·2 | 0·4 | 0·6 | 0·8 | 1·0 | 1·3 | 1·5 | 1·7 | 04 30 |
| 05 00 | −1·1 | −0·9 | −0·7 | −0·4 | −0·2 | 0·0 | +0·2 | +0·4 | +0·6 | +0·8 | +0·9 | +1·1 | +1·3 | +1·5 | 05 00 |
| 06 00 | 1·0 | 0·8 | 0·6 | 0·4 | 0·2 | 0·0 | 0·2 | 0·3 | 0·5 | 0·6 | 0·8 | 0·9 | 1·1 | 1·3 | 06 00 |
| 07 00 | 0·9 | 0·8 | 0·5 | 0·3 | 0·1 | 0·0 | 0·1 | 0·3 | 0·4 | 0·5 | 0·7 | 0·8 | 0·9 | 1·1 | 07 00 |
| 08 00 | 0·8 | 0·7 | 0·5 | 0·3 | 0·1 | 0·0 | 0·1 | 0·2 | 0·4 | 0·5 | 0·6 | 0·7 | 0·8 | 0·9 | 08 00 |
| 09 00 | 0·7 | 0·6 | 0·5 | 0·4 | 0·2 | 0·1 | 0·2 | 0·3 | 0·4 | 0·5 | 0·6 | 0·7 | 0·8 | 0·9 | 09 00 |
| 10 00 | −0·7 | −0·5 | −0·4 | −0·3 | −0·2 | −0·1 | 0·0 | +0·1 | +0·2 | +0·3 | +0·4 | +0·5 | +0·6 | +0·7 | 10 00 |
| 12 00 | 0·6 | 0·5 | 0·4 | 0·3 | 0·2 | 0·1 | 0·0 | 0·1 | 0·2 | 0·2 | 0·3 | 0·4 | 0·5 | 0·5 | 12 00 |
| 14 00 | 0·5 | 0·4 | 0·3 | 0·2 | 0·1 | 0·1 | 0·0 | 0·1 | 0·1 | 0·2 | 0·3 | 0·3 | 0·4 | 0·5 | 14 00 |
| 16 00 | 0·4 | 0·3 | 0·3 | 0·2 | 0·1 | 0·1 | 0·0 | 0·1 | 0·1 | 0·2 | 0·2 | 0·3 | 0·3 | 0·4 | 16 00 |
| 18 00 | 0·4 | 0·3 | 0·2 | 0·2 | 0·1 | 0·1 | 0·0 | +0·1 | 0·1 | 0·2 | 0·2 | 0·2 | 0·3 | 0·3 | 18 00 |
| 20 00 | −0·3 | −0·3 | −0·2 | −0·2 | −0·1 | 0·0 | 0·0 | 0·1 | +0·1 | +0·1 | +0·2 | +0·2 | +0·3 | +0·3 | 20 00 |
| 25 00 | 0·3 | 0·2 | 0·2 | 0·1 | 0·1 | 0·0 | 0·0 | 0·1 | 0·1 | 0·1 | 0·2 | 0·2 | 0·2 | 0·2 | 25 00 |
| 30 00 | 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 | 0·2 | 30 00 |
| 35 00 | 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 | 0·2 | 35 00 |
| 40 00 | 0·1 | 0·1 | 0·1 | 0·1 | 0·0 | 0·0 | 0·0 | 0·0 | 0·1 | 0·1 | 0·1 | 0·1 | 0·1 | 0·1 | 40 00 |
| 50 00 | −0·1 | −0·1 | −0·1 | 0·0 | 0·0 | 0·0 | 0·0 | 0·0 | 0·0 | 0·1 | 0·1 | 0·1 | 0·1 | 0·1 | 50 00 |