

| Aries           |          |  | Venus                      |          |      | Mars                     |          |      | Jupiter                    |          |      | Saturn                    |          |      |
|-----------------|----------|--|----------------------------|----------|------|--------------------------|----------|------|----------------------------|----------|------|---------------------------|----------|------|
| Mon             | GHA      |  | GHA                        | Dec      |      | GHA                      | Dec      |      | GHA                        | Dec      |      | GHA                       | Dec      |      |
| 0               | 311°35.5 |  | 135°13.4                   | N01°21.8 |      | 227°40.7                 | N23°26.4 |      | 181°39.2                   | N18°53.0 |      | 297°04.2                  | N03°27.4 |      |
| 1               | 326°38.0 |  | 150°13.6                   | 20.5     |      | 242°41.3                 | 26.5     |      | 196°41.1                   | 52.9     |      | 312°06.7                  | 27.4     |      |
| 2               | 341°40.4 |  | 165°13.8                   |          | 19.3 | 257°42.0                 | 26.6     |      | 211°43.0                   | 52.7     |      | 327°09.2                  | 27.4     |      |
| 3               | 356°42.9 |  | 180°14.0                   | ..       | 18.1 | 272°42.6                 | ..       | 26.7 | 226°44.9                   | ..       | 52.6 | 342°11.7                  | ..       | 27.3 |
| 4               | 11°45.4  |  | 195°14.2                   |          | 16.9 | 287°43.2                 | 26.8     |      | 241°46.8                   | 52.4     |      | 357°14.2                  | 27.3     |      |
| 5               | 26°47.2  |  | 210°14.4                   |          | 15.6 | 302°43.9                 | 26.9     |      | 256°48.7                   | 52.3     |      | 12°16.7                   | 27.3     |      |
| 6               | 41°50.3  |  | 225°14.6                   | N01°14.4 |      | 317°44.5                 | N23°27.0 |      | 271°50.6                   | N18°52.2 |      | 27°19.2                   | N03°27.3 |      |
| 7               | 56°52.8  |  | 240°14.8                   |          | 13.2 | 332°45.1                 | 27.1     |      | 286°52.5                   | 52.0     |      | 42°21.7                   | 27.2     |      |
| 8               | 71°55.2  |  | 255°15.0                   |          | 12.0 | 347°45.8                 | 27.2     |      | 301°54.4                   | 51.9     |      | 57°24.2                   | 27.2     |      |
| 9               | 86°57.7  |  | 270°15.2                   | ..       | 10.7 | 2°46.4                   | ..       | 27.3 | 316°56.3                   | ..       | 51.8 | 72°26.6                   | ..       | 27.2 |
| 10              | 102°00.1 |  | 285°15.4                   |          | 09.5 | 17°47.0                  | 27.4     |      | 331°58.2                   | 51.6     |      | 87°29.1                   | 27.2     |      |
| 11              | 117°02.6 |  | 300°15.5                   |          | 08.3 | 32°47.7                  | 27.5     |      | 347°00.1                   | 51.5     |      | 102°31.6                  | 27.2     |      |
| 12              | 132°05.1 |  | 315°15.7                   | N01°07.1 |      | 47°48.3                  | N23°27.6 |      | 2°02.0                     | N18°51.3 |      | 117°34.1                  | N03°27.1 |      |
| 13              | 147°07.5 |  | 330°15.9                   |          | 05.8 | 62°48.9                  | 27.8     |      | 17°03.9                    | 51.2     |      | 132°36.6                  | 27.1     |      |
| 14              | 162°10.0 |  | 345°16.1                   |          | 04.6 | 77°49.6                  | 27.9     |      | 32°05.8                    | 51.1     |      | 147°39.1                  | 27.1     |      |
| 15              | 177°12.5 |  | 0°16.3                     | ..       | 03.4 | 92°50.2                  | ..       | 28.0 | 47°07.7                    | ..       | 50.9 | 162°41.6                  | ..       | 27.1 |
| 16              | 192°14.9 |  | 15°16.5                    |          | 02.2 | 107°50.8                 | 28.0     |      | 62°09.6                    | 50.8     |      | 177°44.1                  | 27.0     |      |
| 17              | 207°17.4 |  | 30°16.7                    | 01°00.9  |      | 122°51.5                 | 28.1     |      | 77°11.5                    | 50.6     |      | 192°46.6                  | 27.0     |      |
| 18              | 222°19.9 |  | 45°16.9                    | N00°59.7 |      | 137°52.1                 | N23°28.2 |      | 92°13.4                    | N18°50.5 |      | 207°49.1                  | N03°27.0 |      |
| 19              | 237°22.3 |  | 60°17.1                    |          | 58.5 | 152°52.7                 | 28.3     |      | 107°15.3                   | 50.4     |      | 222°51.5                  | 27.0     |      |
| 20              | 252°24.8 |  | 75°17.4                    |          | 57.3 | 167°53.4                 | 28.4     |      | 122°17.2                   | 50.2     |      | 237°54.0                  | 26.9     |      |
| 21              | 267°27.3 |  | 90°17.6                    | ..       | 56.0 | 182°54.0                 | ..       | 28.5 | 137°19.1                   | ..       | 50.1 | 252°56.5                  | ..       | 26.9 |
| 22              | 282°29.7 |  | 105°17.8                   |          | 54.8 | 197°54.6                 | 28.6     |      | 152°21.0                   | 50.0     |      | 267°59.0                  | 26.9     |      |
| 23              | 297°32.2 |  | 120°18.0                   |          | 53.6 | 212°55.3                 | 28.7     |      | 167°22.9                   | 49.8     |      | 283°01.5                  | 26.9     |      |
| Mer.pass. 03:13 |          |  | $\nu$ 0.2' d -1.2' m -4.29 |          |      | $\nu$ 0.6' d 0.1' m 1.30 |          |      | $\nu$ 1.9' d -0.1' m -1.78 |          |      | $\nu$ 2.5' d -0.0' m 0.62 |          |      |

| Tue             | GHA      |  | GHA                        | Dec      |      | GHA                      | Dec      |      | GHA                        | Dec      |      | GHA                       | Dec      |      |
|-----------------|----------|--|----------------------------|----------|------|--------------------------|----------|------|----------------------------|----------|------|---------------------------|----------|------|
| 0               | 312°34.6 |  | 135°18.2                   | N00°52.4 |      | 227°55.9                 | N23°28.8 |      | 182°24.8                   | N18°49.7 |      | 298°04.0                  | N03°26.9 |      |
| 1               | 327°37.1 |  | 150°16.6                   | 51.1     |      | 242°56.5                 | 28.9     |      | 197°26.7                   | 49.5     |      | 313°06.5                  | 26.8     |      |
| 2               | 342°39.6 |  | 165°18.6                   |          | 49.9 | 257°57.2                 | 29.0     |      | 212°28.6                   | 49.4     |      | 328°09.0                  | 26.8     |      |
| 3               | 357°42.0 |  | 180°18.8                   | ..       | 48.7 | 272°57.8                 | ..       | 29.1 | 227°30.5                   | ..       | 49.3 | 343°11.5                  | ..       | 26.8 |
| 4               | 12°44.5  |  | 195°19.0                   |          | 47.5 | 287°58.4                 | 29.2     |      | 242°32.4                   | 49.1     |      | 358°14.0                  | 26.8     |      |
| 5               | 27°47.0  |  | 210°19.2                   |          | 46.2 | 302°59.1                 | 29.3     |      | 257°34.3                   | 49.0     |      | 13°16.5                   | 26.7     |      |
| 6               | 42°49.4  |  | 225°19.4                   | N00°45.0 |      | 317°59.7                 | N23°29.4 |      | 272°36.2                   | N18°48.9 |      | 28°19.0                   | N03°26.7 |      |
| 7               | 57°51.9  |  | 240°19.6                   |          | 43.8 | 333°00.4                 | 29.5     |      | 287°38.0                   | 48.7     |      | 43°21.4                   | 26.7     |      |
| 8               | 72°54.4  |  | 255°19.8                   |          | 42.6 | 348°01.0                 | 29.6     |      | 302°39.9                   | 48.6     |      | 58°23.9                   | 26.7     |      |
| 9               | 87°56.8  |  | 270°20.0                   | ..       | 41.3 | 3°01.6                   | ..       | 29.7 | 317°41.8                   | ..       | 48.4 | 73°26.4                   | ..       | 26.6 |
| 10              | 102°59.3 |  | 285°20.2                   |          | 40.1 | 18°02.3                  | 29.8     |      | 332°43.7                   | 48.3     |      | 88°28.9                   | 26.6     |      |
| 11              | 118°01.7 |  | 300°20.5                   |          | 38.9 | 33°02.9                  | 29.9     |      | 347°45.6                   | 48.2     |      | 103°31.4                  | 26.6     |      |
| 12              | 133°04.2 |  | 315°20.7                   | N00°37.7 |      | 48°03.5                  | N23°30.0 |      | 2°47.5                     | N18°48.0 |      | 118°33.9                  | N03°26.6 |      |
| 13              | 148°06.7 |  | 330°20.9                   |          | 36.4 | 63°04.2                  | 30.1     |      | 17°49.4                    | 47.9     |      | 133°36.4                  | 26.5     |      |
| 14              | 163°09.1 |  | 345°21.1                   |          | 35.2 | 78°04.8                  | 30.1     |      | 32°51.3                    | 47.7     |      | 148°38.9                  | 26.5     |      |
| 15              | 178°11.6 |  | 0°21.3                     | ..       | 34.0 | 93°05.4                  | ..       | 30.2 | 47°53.2                    | ..       | 47.6 | 163°41.4                  | ..       | 26.5 |
| 16              | 193°14.1 |  | 15°21.5                    |          | 32.8 | 108°06.1                 | 30.3     |      | 62°55.1                    | 47.5     |      | 178°43.9                  | 26.5     |      |
| 17              | 208°16.5 |  | 30°21.7                    |          | 31.5 | 123°06.7                 | 30.4     |      | 77°57.0                    | 47.3     |      | 193°46.4                  | 26.4     |      |
| 18              | 223°19.0 |  | 45°21.9                    | N00°30.3 |      | 138°07.3                 | N23°30.5 |      | 92°58.9                    | N18°47.2 |      | 208°48.9                  | N03°26.4 |      |
| 19              | 238°21.5 |  | 60°22.2                    |          | 29.1 | 153°08.0                 | 30.6     |      | 108°00.8                   | 47.0     |      | 223°51.4                  | 26.4     |      |
| 20              | 253°23.9 |  | 75°22.4                    |          | 27.9 | 168°08.6                 | 30.7     |      | 123°02.7                   | 46.9     |      | 238°53.9                  | 26.4     |      |
| 21              | 268°26.4 |  | 90°22.6                    | ..       | 26.6 | 183°09.3                 | ..       | 30.8 | 138°04.6                   | ..       | 46.8 | 253°56.4                  | ..       | 26.3 |
| 22              | 283°28.9 |  | 105°22.8                   |          | 25.4 | 198°09.9                 | 30.9     |      | 153°06.5                   | 46.6     |      | 268°58.9                  | 26.3     |      |
| 23              | 298°31.3 |  | 120°23.0                   |          | 24.2 | 213°10.5                 | 31.0     |      | 168°08.4                   | 46.5     |      | 284°01.4                  | 26.3     |      |
| Mer.pass. 03:09 |          |  | $\nu$ 0.2' d -1.2' m -4.30 |          |      | $\nu$ 0.6' d 0.1' m 1.30 |          |      | $\nu$ 1.9' d -0.1' m -1.78 |          |      | $\nu$ 2.5' d -0.0' m 0.62 |          |      |

| Wed             | GHA      |  | GHA                        | Dec      |      | GHA                      | Dec      |      | GHA                        | Dec      |      | GHA                       | Dec      |      |
|-----------------|----------|--|----------------------------|----------|------|--------------------------|----------|------|----------------------------|----------|------|---------------------------|----------|------|
| 0               | 313°33.8 |  | 135°23.2                   | N00°23.0 |      | 228°11.2                 | N23°31.0 |      | 183°10.3                   | N18°46.4 |      | 299°03.9                  | N03°26.3 |      |
| 1               | 328°36.2 |  | 150°23.5                   |          | 21.8 | 243°11.8                 | 31.1     |      | 198°12.2                   | 46.2     |      | 314°06.3                  | 26.2     |      |
| 2               | 343°38.7 |  | 165°23.7                   |          | 20.5 | 258°12.4                 | 31.2     |      | 213°14.1                   | 46.1     |      | 329°08.8                  | 26.2     |      |
| 3               | 358°41.2 |  | 180°23.9                   | ..       | 19.3 | 273°13.1                 | ..       | 31.3 | 228°16.0                   | ..       | 45.9 | 344°11.3                  | ..       | 26.2 |
| 4               | 13°43.4  |  | 195°24.1                   |          | 18.1 | 288°13.7                 | 31.4     |      | 243°17.9                   | 45.8     |      | 359°13.8                  | 26.2     |      |
| 5               | 28°46.1  |  | 210°24.3                   |          | 16.9 | 303°14.4                 | 31.5     |      | 258°18.8                   | 45.7     |      | 14°16.3                   | 26.1     |      |
| 6               | 43°48.6  |  | 225°24.6                   | N00°15.6 |      | 318°15.0                 | N23°31.6 |      | 273°21.7                   | N18°45.5 |      | 29°18.8                   | N03°26.1 |      |
| 7               | 58°51.0  |  | 240°24.8                   |          | 14.4 | 333°15.6                 | 31.7     |      | 288°23.6                   | 45.4     |      | 44°21.3                   | 26.1     |      |
| 8               | 73°53.5  |  | 255°25.0                   |          | 13.2 | 348°16.3                 | 31.7     |      | 303°25.5                   | 45.2     |      | 59°23.8                   | 26.1     |      |
| 9               | 88°56.0  |  | 270°25.2                   | ..       | 12.0 | 3°16.9                   | ..       | 31.8 | 318°27.4                   | ..       | 45.1 | 74°26.3                   | ..       | 26.0 |
| 10              | 103°58.4 |  | 285°25.5                   |          | 10.7 | 18°17.5                  | 31.9     |      | 333°29.3                   | 45.0     |      | 89°28.8                   | 26.0     |      |
| 11              | 119°00.9 |  | 300°25.7                   |          | 09.5 | 33°18.2                  | 32.0     |      | 348°31.2                   | 44.8     |      | 104°31.3                  | 26.0     |      |
| 12              | 134°03.3 |  | 315°25.9                   | N00°08.3 |      | 48°18.8                  | N23°32.1 |      | 3°33.1                     | N18°44.7 |      | 119°33.8                  | N03°26.0 |      |
| 13              | 149°05.8 |  | 330°26.1                   |          | 07.1 | 63°19.5                  | 32.2     |      | 18°35.0                    | 44.5     |      | 134°36.3                  | 25.9     |      |
| 14              | 164°08.3 |  | 345°26.4                   |          | 05.8 | 78°20.1                  | 32.2     |      | 33°36.9                    | 44.4     |      | 149°38.8                  | 25.9     |      |
| 15              | 179°10.7 |  | 0°26.6                     | ..       | 04.6 | 93°20.7                  | ..       | 32.3 | 48°38.8                    | ..       | 44.3 | 164°41.3                  | ..       | 25.9 |
| 16              | 194°13.2 |  | 15°26.8                    |          | 03.4 | 108°21.4                 | 32.4     |      | 63°40.7                    | 44.1     |      | 179°43.8                  | 25.8     |      |
| 17              | 209°15.7 |  | 30°27.0                    |          | 02.2 | 123°22.0                 | 32.5     |      | 78°42.6                    | 44.0     |      | 194°46.3                  | 25.8     |      |
| 18              | 224°18.1 |  | 45°27.3                    | N00°00.9 |      | 138°22.7                 | N23°32.6 |      | 93°44.5                    | N18°43.9 |      | 209°48.8                  | N03°25.8 |      |
| 19              | 239°20.6 |  | 60°27.5                    | S00°00.3 |      | 153°23.3                 | 32.7     |      | 108°46.4                   | 43.7     |      | 224°51.3                  | 25.8     |      |
| 20              | 254°23.1 |  | 75°27.7                    |          | 01.5 | 168°23.9                 | 32.7     |      | 123°48.3                   | 43.6     |      | 239°53.8                  | 25.7     |      |
| 21              | 269°25.5 |  | 90°28.0                    | ..       | 02.7 | 183°24.6                 | ..       | 32.8 | 138°50.2                   | ..       | 43.4 | 254°56.3                  | ..       | 25.7 |
| 22              | 284°28.0 |  | 105°28.2                   |          | 01.9 | 198°25.2                 | 32.9     |      | 153°52.1                   | 43.3     |      | 269°58.8                  | 25.7     |      |
| 23              | 299°30.5 |  | 120°28.4                   |          | 05.2 | 213°25.8                 | 33.0     |      | 168°54.0                   | 43.2     |      | 285°01.3                  | 25.7     |      |
| Mer.pass. 03:05 |          |  | $\nu$ 0.2' d -1.2' m -4.31 |          |      | $\nu$ 0.6' d 0.1' m 1.30 |          |      | $\nu$ 1.9' d -0.1' m -1.78 |          |      | $\nu$ 2.5' d -0.0' m 0.61 |          |      |

| Stars               |          |           |
|---------------------|----------|-----------|
|                     | SHA      | Dec       |
| Alpheratz           | 357°33.2 | 29°14.2   |
| Ankaa               | 353°05.6 | -42°09.4  |
| Schedar             | 349°29.2 | 56°40.9   |
| Diphda              | 348°45.8 | -17°50.2  |
| Achernar            | 335°19.1 | -57°05.7  |
| Hamal               | 327°49.7 | 23°35.3   |
| Polaris             | 313°24.9 | 89°22.2   |
| Acamar              | 315°10.8 | -40°11.5  |
| Menkar              | 314°04.8 | 4°11.8    |
| Mirfak              | 308°26.5 | 49°57.2   |
| Aldebaran           | 290°38.3 | 16°33.8   |
| Rigel               | 281°02.8 | -8°10.1   |
| Capella             | 280°20.3 | 46°01.3   |
| Bellatrix           | 278°21.7 | 6°22.5    |
| Elath               | 278°00.5 | 28°37.7   |
| Altinilam           | 275°36.6 | -11°10.1  |
| Betegeuse           | 270°50.9 | 7°24.8    |
| Canopus             | 263°52.3 | -52°42.3  |
| Sirius              | 258°25.4 | -16°45.0  |
| Adhara              | 255°05.2 | -29°00.3  |
| Procyon             | 244°49.8 | 5°09.5    |
| Pollux              | 243°16.1 | 27°57.7   |
| Avior               | 234°14.9 | -59°35.6  |
| Suhail              | 222°45.8 | -43°32.4  |
| Miaplacidus         | 221°39.0 | -69°49.6  |
| Alphard             | 217°46.8 | -8°46.4   |
| Regulus             | 207°33.4 | 11°50.3   |
| Dubhe               | 193°40.0 | 61°36.6   |
| Denebola            | 182°23.8 | 14°25.5   |
| Gienah              | 175°42.4 | -17°41.4  |
| Acrux               | 172°59.0 | -63°15.0  |
| Gacrux              | 171°50.5 | -57°16.0  |
| Alloth              | 166°12.1 | 55°49.2   |
| Spica               | 158°21.0 | -13°18.0  |
| Alkaid              | 152°51.1 | 49°11.1   |
| Hadar               | 148°34.2 | -60°30.3  |
| Menkent             | 147°56.1 | -36°30.2  |
| Arcturus            | 145°46.7 | 19°02.8   |
| Rigel Kent          | 139°38.5 | -60°57.0  |
| Kochab              | 137°19.8 | 74°03.0   |
| Zuben ubi           | 136°54.5 | -16°09.2  |
| Alphecca            | 126°02.5 | 26°37.7   |
| Antares             | 112°14.0 | -26°29.5  |
| Atria               | 107°06.8 | -69°04.7  |
| Sabik               | 102°01.8 | -29°02.8  |
| Shaula              | 96°08.3  | 37°07.4   |
| Rasalhague          | 95°57.1  | 12°32.6   |
| Eltanin             | 90°41.2  | 51°29.3   |
| Kaus Aust.          | 83°30.4  | -34°22.3  |
| Vega                | 80°32.0  | 38°48.6   |
| Nunki               | 75°54.8  | -26°15.8  |
| Altair              | 61°58.4  | 8°56.4    |
| Peacock             | 53°03.1  | -56°38.9  |
| Deneb               | 49°24.4  | 45°22.6   |
| Enif                | 33°37.2  | 9°59.9    |
| Al Na'ir            | 27°30.8  | -46°49.7  |
| Fomalhaut           | 15°48.8  | -29°28.7  |
| Scheat              | 13°43.4  | 28°57.7   |
| Markab              | 13°28.3  | 15°21.0   |
|                     |          |           |
| Aug 03 Mon          | SHA      | Mer-pass. |
| Venus               | 183°37.9 | 14.59     |
| Mars                | 276°05.2 | 08.49     |
| Jupiter             | 230°03.7 | 11.52     |
| Saturn              | 345°28.7 | 04.11     |
|                     |          |           |
| Aug 04 Tue          | SHA      | Mer-pass. |
| Venus               | 182°43.5 | 14.59     |
| Mars                | 275°21.3 | 08.48     |
| Jupiter             | 229°50.1 | 11.49     |
| Saturn              | 345°29.4 | 04.07     |
|                     |          |           |
| Aug 05 Wed          | SHA      | Mer-pass. |
| Venus               | 181°49.5 | 14.58     |
| Mars                | 274°37.4 | 08.47     |
| Jupiter             | 229°36.6 | 11.46     |
| Saturn              | 345°30.1 | 04.03     |
|                     |          |           |
| Horizontal parallax |          |           |
| Venus:              | 0.2      |           |
| Mars:               | 0.1      |           |

| Aries           |          |          | Venus                     |          |          | Mars                     |          |          | Jupiter                    |     |     | Saturn                    |     |     |
|-----------------|----------|----------|---------------------------|----------|----------|--------------------------|----------|----------|----------------------------|-----|-----|---------------------------|-----|-----|
| Thu             | GHA      | Dec      | GHA                       | Dec      | Dec      | GHA                      | Dec      | Dec      | GHA                        | Dec | Dec | GHA                       | Dec | Dec |
| 0               | 314°32.9 | 135°28.7 | S00°06.4                  | 228°26.5 | N23°33.1 | 183°55.9                 | N18°43.0 | 300°03.8 | N03°25.6                   |     |     |                           |     |     |
| 1               | 329°35.4 | 150°28.9 | 07.6                      | 243°27.1 | 33.1     | 198°57.8                 | 42.9     | 315°06.3 | 25.6                       |     |     |                           |     |     |
| 2               | 344°37.8 | 165°29.1 | 08.8                      | 258°27.8 | 33.2     | 213°59.7                 | 42.7     | 330°08.8 | 25.6                       |     |     |                           |     |     |
| 3               | 359°40.3 | 180°29.4 | .. 10.1                   | 273°28.4 | .. 33.3  | 229°01.6                 | .. 42.6  | 345°11.3 | .. 25.6                    |     |     |                           |     |     |
| 4               | 14°42.8  | 195°29.6 | 11.3                      | 288°29.0 | 33.4     | 244°03.5                 | 42.5     | 0°13.8   | 25.5                       |     |     |                           |     |     |
| 5               | 29°45.2  | 210°29.8 | 12.5                      | 303°29.7 | 33.4     | 259°05.4                 | 42.3     | 15°16.3  | 25.5                       |     |     |                           |     |     |
| 6               | 44°47.7  | 225°30.1 | S00°13.7                  | 318°30.3 | N23°33.1 | 274°07.3                 | N18°42.2 | 30°18.8  | N03°25.5                   |     |     |                           |     |     |
| 7               | 59°50.2  | 240°30.3 | 15.0                      | 333°31.0 | 33.6     | 289°09.2                 | 42.0     | 45°21.3  | 25.4                       |     |     |                           |     |     |
| 8               | 74°52.6  | 255°30.5 | 16.2                      | 348°31.6 | 33.7     | 304°11.1                 | 41.9     | 60°23.8  | 25.4                       |     |     |                           |     |     |
| 9               | 89°55.1  | 270°30.8 | .. 17.4                   | 3°32.2   | .. 33.8  | 319°13.0                 | .. 41.8  | 75°26.3  | .. 25.4                    |     |     |                           |     |     |
| 10              | 104°57.6 | 285°31.0 | 18.6                      | 18°32.9  | 33.8     | 334°14.9                 | 41.6     | 90°28.8  | 25.4                       |     |     |                           |     |     |
| 11              | 120°00.0 | 300°31.2 | 19.9                      | 33°33.5  | 33.9     | 349°16.8                 | 41.5     | 105°31.3 | 25.3                       |     |     |                           |     |     |
| 12              | 135°02.5 | 315°31.5 | S00°21.1                  | 48°34.2  | N23°34.0 | 4°18.7                   | N18°41.3 | 120°33.8 | N03°25.3                   |     |     |                           |     |     |
| 13              | 150°05.0 | 330°31.7 | 22.3                      | 63°34.8  | 34.1     | 19°20.6                  | 41.2     | 135°36.3 | 25.3                       |     |     |                           |     |     |
| 14              | 165°07.4 | 345°32.0 | 23.5                      | 78°35.4  | 34.1     | 34°22.5                  | 41.1     | 150°38.8 | 25.3                       |     |     |                           |     |     |
| 15              | 180°09.9 | 0°32.2   | .. 24.7                   | 93°36.1  | .. 34.2  | 49°24.4                  | .. 40.9  | 165°41.3 | .. 25.2                    |     |     |                           |     |     |
| 16              | 195°12.3 | 15°32.4  | 26.0                      | 108°36.7 | 34.3     | 64°26.3                  | 40.8     | 180°43.8 | 25.0                       |     |     |                           |     |     |
| 17              | 210°14.8 | 30°32.7  | 27.2                      | 123°37.4 | 34.4     | 79°28.2                  | 40.6     | 195°46.3 | 25.2                       |     |     |                           |     |     |
| 18              | 225°17.3 | 45°32.9  | S00°28.4                  | 138°38.0 | N23°34.4 | 94°30.1                  | N18°40.5 | 210°48.0 | N03°25.1                   |     |     |                           |     |     |
| 19              | 240°19.7 | 60°33.2  | 29.6                      | 153°38.7 | 34.5     | 109°32.0                 | 40.4     | 225°51.3 | 25.1                       |     |     |                           |     |     |
| 20              | 255°22.2 | 75°33.4  | 30.9                      | 168°39.3 | 34.6     | 124°33.9                 | 40.2     | 240°53.8 | 25.1                       |     |     |                           |     |     |
| 21              | 270°24.7 | 90°33.7  | .. 32.1                   | 183°39.9 | .. 34.6  | 139°35.8                 | .. 40.1  | 255°56.3 | .. 25.1                    |     |     |                           |     |     |
| 22              | 285°27.1 | 105°33.9 | 33.3                      | 198°40.6 | 34.7     | 154°37.7                 | 39.9     | 270°58.8 | 25.0                       |     |     |                           |     |     |
| 23              | 300°29.6 | 120°34.1 | 34.5                      | 213°41.2 | 34.8     | 169°39.6                 | 39.8     | 286°01.3 | 25.0                       |     |     |                           |     |     |
| Mer.pass. 03:01 |          |          | $\nu$ 0.2° d 1.2' m -4.32 |          |          | $\nu$ 0.6° d 0.1' m 1.30 |          |          | $\nu$ 1.9° d -0.1' m -1.78 |     |     | $\nu$ 2.5° d -0.0' m 0.60 |     |     |

| Fri             | GHA      |          | Dec                       | GHA      |          | Dec                      | GHA      |          | Dec                        |  |  |                           |  |  |
|-----------------|----------|----------|---------------------------|----------|----------|--------------------------|----------|----------|----------------------------|--|--|---------------------------|--|--|
| 0               | 315°32.1 | 135°34.4 | S00°35.7                  | 228°41.9 | N23°34.9 | 184°41.5                 | N18°39.7 | 301°03.8 | N03°25.0                   |  |  |                           |  |  |
| 1               | 330°34.5 | 150°34.6 | 37.0                      | 243°42.5 | 34.9     | 199°43.4                 | 39.5     | 316°06.3 | 24.9                       |  |  |                           |  |  |
| 2               | 345°37.0 | 165°34.9 | 38.2                      | 258°43.1 | 35.0     | 214°45.3                 | 39.4     | 331°08.8 | 24.9                       |  |  |                           |  |  |
| 3               | 0°39.5   | 180°35.1 | .. 39.4                   | 273°43.8 | .. 35.1  | 229°47.2                 | .. 39.2  | 346°11.3 | .. 24.9                    |  |  |                           |  |  |
| 4               | 15°41.9  | 195°35.4 | 40.6                      | 288°44.4 | 35.1     | 244°49.1                 | 39.1     | 1°13.8   | 24.9                       |  |  |                           |  |  |
| 5               | 30°44.4  | 210°35.6 | 41.9                      | 303°45.1 | 35.2     | 259°51.0                 | 39.0     | 16°16.4  | 24.8                       |  |  |                           |  |  |
| 6               | 45°46.8  | 225°35.9 | S00°43.1                  | 318°45.7 | N23°35.3 | 274°52.9                 | N18°38.8 | 31°18.9  | N03°24.8                   |  |  |                           |  |  |
| 7               | 60°49.3  | 240°36.1 | 44.3                      | 333°46.4 | 35.3     | 289°54.8                 | 38.7     | 46°21.4  | 24.8                       |  |  |                           |  |  |
| 8               | 75°51.8  | 255°36.4 | 45.5                      | 348°47.0 | 35.4     | 304°56.7                 | 38.5     | 61°23.9  | 24.7                       |  |  |                           |  |  |
| 9               | 90°54.2  | 270°36.6 | .. 46.7                   | 3°47.6   | .. 35.5  | 319°58.6                 | .. 38.4  | 76°26.4  | .. 24.7                    |  |  |                           |  |  |
| 10              | 105°56.7 | 285°36.9 | 48.0                      | 18°48.3  | 35.6     | 335°00.5                 | 38.3     | 91°28.9  | 24.7                       |  |  |                           |  |  |
| 11              | 120°59.2 | 300°37.1 | 49.2                      | 33°48.9  | 35.6     | 350°02.4                 | 38.1     | 106°31.4 | 24.7                       |  |  |                           |  |  |
| 12              | 136°01.6 | 315°37.4 | S00°50.4                  | 48°49.6  | N23°35.7 | 5°04.3                   | N18°38.0 | 121°33.9 | N03°24.6                   |  |  |                           |  |  |
| 13              | 151°04.1 | 330°37.6 | 51.6                      | 63°50.2  | 35.8     | 20°06.2                  | 37.8     | 136°36.4 | 24.6                       |  |  |                           |  |  |
| 14              | 166°06.6 | 345°37.9 | 52.8                      | 78°50.9  | 35.8     | 35°08.1                  | 37.7     | 151°38.9 | 24.6                       |  |  |                           |  |  |
| 15              | 181°09.0 | 0°38.1   | .. 54.1                   | 93°51.5  | .. 35.9  | 50°10.0                  | .. 37.6  | 166°41.4 | .. 24.5                    |  |  |                           |  |  |
| 16              | 196°11.5 | 15°38.4  | 55.3                      | 108°52.1 | 35.9     | 65°11.9                  | 37.4     | 181°43.9 | 24.5                       |  |  |                           |  |  |
| 17              | 211°13.9 | 30°38.7  | 56.5                      | 123°52.8 | 36.0     | 80°13.8                  | 37.3     | 196°46.4 | 24.5                       |  |  |                           |  |  |
| 18              | 226°16.4 | 45°38.9  | S00°57.7                  | 138°53.4 | N23°36.1 | 95°15.7                  | N18°37.1 | 211°48.9 | N03°24.4                   |  |  |                           |  |  |
| 19              | 241°18.9 | 60°39.2  | 00°58.9                   | 153°54.1 | 36.1     | 110°17.6                 | 37.0     | 226°51.4 | 24.4                       |  |  |                           |  |  |
| 20              | 256°21.3 | 75°39.4  | 01°00.2                   | 168°54.7 | 36.2     | 125°19.6                 | 36.9     | 241°53.9 | 24.4                       |  |  |                           |  |  |
| 21              | 271°23.8 | 90°39.7  | .. 01.4                   | 183°55.4 | .. 36.3  | 140°21.5                 | .. 36.7  | 256°56.4 | .. 24.3                    |  |  |                           |  |  |
| 22              | 286°26.3 | 105°39.9 | 02.6                      | 198°56.0 | 36.3     | 155°23.4                 | 36.6     | 271°58.9 | 24.3                       |  |  |                           |  |  |
| 23              | 301°28.7 | 120°40.2 | 03.8                      | 213°56.7 | 36.4     | 170°25.3                 | 36.4     | 287°01.5 | 24.3                       |  |  |                           |  |  |
| Mer.pass. 02:57 |          |          | $\nu$ 0.2° d 1.2' m -4.33 |          |          | $\nu$ 0.6° d 0.1' m 1.29 |          |          | $\nu$ 1.9° d -0.1' m -1.78 |  |  | $\nu$ 2.5° d -0.0' m 0.60 |  |  |

| Sat             | GHA      |          |                           | Dec      |          |                          | GHA      |          |                            | Dec |  |                           | GHA |  |  | Dec |  |  |
|-----------------|----------|----------|---------------------------|----------|----------|--------------------------|----------|----------|----------------------------|-----|--|---------------------------|-----|--|--|-----|--|--|
| 0               | 316°31.2 | 135°40.5 | S01°05.1                  | 228°57.3 | N23°36.5 | 185°27.2                 | N18°36.3 | 302°04.0 | N03°24.3                   |     |  |                           |     |  |  |     |  |  |
| 1               | 331°33.7 | 150°40.7 | 06.3                      | 243°57.9 | 36.5     | 200°29.1                 | 36.2     | 317°06.5 | 24.2                       |     |  |                           |     |  |  |     |  |  |
| 2               | 346°36.1 | 165°41.0 | 07.5                      | 258°58.6 | 36.6     | 215°31.0                 | 36.0     | 332°09.0 | 24.2                       |     |  |                           |     |  |  |     |  |  |
| 3               | 1°38.6   | 180°41.2 | .. 08.7                   | 273°59.2 | .. 36.6  | 230°32.9                 | .. 35.9  | 347°11.5 | .. 24.2                    |     |  |                           |     |  |  |     |  |  |
| 4               | 16°41.4  | 195°41.5 | 09.9                      | 288°59.1 | 36.7     | 245°34.8                 | 35.7     | 2°14.0   | 24.1                       |     |  |                           |     |  |  |     |  |  |
| 5               | 31°43.5  | 210°41.8 | 11.2                      | 304°00.5 | 36.8     | 260°36.7                 | 35.6     | 17°16.5  | 24.1                       |     |  |                           |     |  |  |     |  |  |
| 6               | 46°46.0  | 225°42.0 | S01°12.4                  | 319°01.2 | N23°36.8 | 275°38.6                 | N18°35.5 | 32°19.0  | N03°24.1                   |     |  |                           |     |  |  |     |  |  |
| 7               | 61°48.4  | 240°42.3 | 13.6                      | 334°01.8 | 36.9     | 290°40.5                 | 35.3     | 47°21.5  | 24.1                       |     |  |                           |     |  |  |     |  |  |
| 8               | 76°50.9  | 255°42.5 | 14.8                      | 349°02.5 | 37.0     | 305°42.4                 | 35.2     | 62°24.0  | 24.0                       |     |  |                           |     |  |  |     |  |  |
| 9               | 91°53.4  | 270°42.8 | .. 16.0                   | 4°03.1   | .. 37.0  | 320°44.3                 | .. 35.0  | 77°26.5  | .. 24.0                    |     |  |                           |     |  |  |     |  |  |
| 10              | 106°55.8 | 285°43.1 | 17.3                      | 19°03.8  | 37.1     | 335°46.2                 | 34.9     | 92°29.0  | 24.0                       |     |  |                           |     |  |  |     |  |  |
| 11              | 121°58.3 | 300°43.3 | 18.5                      | 34°04.4  | 37.1     | 350°48.1                 | 34.8     | 107°31.6 | 23.9                       |     |  |                           |     |  |  |     |  |  |
| 12              | 137°00.8 | 315°43.6 | S01°19.7                  | 49°05.0  | N23°37.2 | 5°50.0                   | N18°34.6 | 122°34.1 | N03°23.9                   |     |  |                           |     |  |  |     |  |  |
| 13              | 152°03.2 | 330°43.9 | 20.9                      | 64°05.7  | 37.2     | 20°51.9                  | 34.5     | 137°36.6 | 23.9                       |     |  |                           |     |  |  |     |  |  |
| 14              | 167°05.7 | 345°44.1 | 22.1                      | 79°06.3  | 37.3     | 35°53.8                  | 34.3     | 152°39.1 | 23.8                       |     |  |                           |     |  |  |     |  |  |
| 15              | 182°08.2 | 0°44.4   | .. 23.3                   | 94°07.0  | .. 37.4  | 50°55.7                  | .. 34.2  | 167°41.6 | .. 23.8                    |     |  |                           |     |  |  |     |  |  |
| 16              | 197°10.6 | 15°44.7  | 24.6                      | 109°07.6 | 37.4     | 65°57.6                  | 34.1     | 182°44.1 | .. 23.8                    |     |  |                           |     |  |  |     |  |  |
| 17              | 212°13.1 | 30°44.9  | 25.8                      | 124°08.3 | 37.5     | 80°59.5                  | 33.9     | 197°46.6 | 23.7                       |     |  |                           |     |  |  |     |  |  |
| 18              | 227°15.6 | 45°45.2  | S01°27.0                  | 139°08.9 | N23°37.5 | 96°01.4                  | N18°33.8 | 212°49.1 | N03°23.7                   |     |  |                           |     |  |  |     |  |  |
| 19              | 242°18.0 | 60°45.5  | 28.2                      | 154°09.6 | 37.6     | 111°03.3                 | 33.6     | 227°51.6 | 23.7                       |     |  |                           |     |  |  |     |  |  |
| 20              | 257°20.5 | 75°45.8  | 29.4                      | 169°10.2 | 37.6     | 126°05.2                 | 33.5     | 242°54.1 | 23.7                       |     |  |                           |     |  |  |     |  |  |
| 21              | 272°22.9 | 90°46.0  | .. 30.7                   | 184°10.9 | .. 37.7  | 141°07.1                 | .. 33.3  | 257°56.7 | .. 23.6                    |     |  |                           |     |  |  |     |  |  |
| 22              | 287°25.4 | 105°46.3 | 31.9                      | 199°11.5 | 37.8     | 156°09.0                 | 33.2     | 272°59.2 | 23.6                       |     |  |                           |     |  |  |     |  |  |
| 23              | 302°27.9 | 120°46.6 | 33.1                      | 214°12.2 | 37.8     | 171°10.9                 | 33.1     | 288°01.7 | 23.6                       |     |  |                           |     |  |  |     |  |  |
| Mer.pass. 02:53 |          |          | $\nu$ 0.3° d 1.2' m -4.34 |          |          | $\nu$ 0.6° d 0.1' m 1.29 |          |          | $\nu$ 1.9° d -0.1' m -1.78 |     |  | $\nu$ 2.5° d -0.0' m 0.60 |     |  |  |     |  |  |

| Stars               |          |          |
|---------------------|----------|----------|
|                     | SHA      | Dec      |
| Alpheratz           | 357°33.2 | 29°14.3  |
| Ankaa               | 353°05.6 | -42°09.4 |
| Schedar             | 349°29.2 | 56°40.9  |
| Diphda              | 348°45.8 | -17°50.2 |
| Achernar            | 335°19.0 | -57°05.7 |
| Hamal               | 327°49.6 | 23°35.3  |
| Polaris             | 313°23.1 | 89°22.2  |
| Acamar              | 315°10.8 | -40°11.5 |
| Menkar              | 314°04.8 | 4°11.8   |
| Mirfak              | 308°26.4 | 49°57.2  |
| Aldebaran           | 290°38.3 | 16°33.8  |
| Rigel               | 281°02.8 | -8°10.1  |
| Capella             | 280°20.2 | 46°01.3  |
| Bellatrix           | 278°21.7 | 6°22.5   |
| Elath               | 278°00.4 | 28°37.7  |
| Anilam              | 275°36.6 | -1°11.0  |
| Betelgeuse          | 270°50.9 | 7°24.8   |
| Canopus             | 263°52.2 | -52°42.3 |
| Sirius              | 258°25.4 | -16°45.0 |
| Adhara              | 255°05.2 | -29°00.3 |
| Procyon             | 244°49.8 | 5°09.5   |
| Pollux              | 243°16.1 | 27°57.7  |
| Avior               | 234°14.8 | -59°35.6 |
| Shuail              | 222°45.8 | -43°32.4 |
| Miaplacidus         | 221°39.0 | -69°49.6 |
| Alphard             | 217°46.8 | -8°46.4  |
| Regulus             | 207°33.4 | 11°50.3  |
| Dubhe               | 193°40.0 | 61°36.6  |
| Denebola            | 182°23.8 | 14°25.5  |
| Gienah              | 175°42.4 | -17°41.4 |
| Acrux               | 172°59.0 | -63°15.0 |
| Gacrux              | 171°50.5 | -57°16.0 |
| Alloth              | 166°12.1 | 55°49.2  |
| Spica               | 158°21.0 | -11°18.0 |
| Alkaid              | 152°51.1 | 49°11.1  |
| Hadar               | 148°34.3 | -60°30.3 |
| Menkent             | 147°56.1 | -36°30.2 |
| Arcturus            | 145°46.8 | 19°02.8  |
| Rigel Kent.         | 139°38.5 | -60°57.0 |
| Kochab              | 137°19.8 | 74°03.0  |
| Zuben'ubi           | 136°54.6 | -16°09.2 |
| Alphecca            | 126°02.6 | 26°37.7  |
| Antares             | 112°14.1 | -26°29.5 |
| Atria               | 107°06.8 | -69°04.7 |
| Sabik               | 102°01.1 | -15°45.5 |
| Shaula              | 96°08.3  | -37°07.4 |
| Rasalhague          | 95°57.1  | 12°32.6  |
| Eltanin             | 90°41.2  | 51°29.3  |
| Kaus Aust.          | 83°30.4  | -34°22.3 |
| Vega                | 80°32.0  | 38°48.7  |
| Nunki               | 75°45.8  | -26°15.8 |
| Altair              | 61°58.4  | 8°56.4   |
| Peacock             | 53°03.1  | -56°38.9 |
| Deneb               | 49°24.4  | -55°22.6 |
| Enif                | 33°37.2  | 9°59.9   |
| Al Na'ir            | 27°30.8  | -46°49.7 |
| Fomalhaut           | 15°12.7  | -29°28.7 |
| Scheat              | 13°43.6  | 28°13.7  |
| Markab              | 13°28.3  | 15°21.0  |
| Aug 06 Thu          |          |          |
| Venus               | 180°55.7 | 14.58    |
| Mars                | 273°53.6 | 08.46    |
| Jupiter             | 229°23.0 | 11.43    |
| Saturn              | 345°30.9 | 03.59    |
| Aug 07 Fri          |          |          |
| Venus               | 180°02.3 | 14.57    |
| Mars                | 273°09.8 | 08.45    |
| Jupiter             | 229°09.5 | 11.40    |
| Saturn              | 345°31.8 | 03.55    |
| Aug 08 Sat          |          |          |
| Venus               | 179°09.3 | 14.57    |
| Mars                | 272°56.8 | 08.44    |
| Jupiter             | 228°50.0 | 11.37    |
| Saturn              | 345°32.8 | 03.51    |
| Horizontal parallax |          |          |
| Venus:              |          | 0.2      |
| Mars:               |          | 0.1      |

| Aries                                                                                                                   |          |          | Venus    |          |          | Mars     |          |          | Jupiter  |     |  | Saturn |     |  |
|-------------------------------------------------------------------------------------------------------------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|-----|--|--------|-----|--|
| Sun                                                                                                                     | GHA      |          | GHA      | Dec      |          | GHA      | Dec      |          | GHA      | Dec |  | GHA    | Dec |  |
| 0                                                                                                                       | 317°30.3 | 135°46.8 | S01°34.3 | 229°12.8 | N23°37.9 | 186°12.8 | N18°32.9 | 303°04.2 | N03°23.5 |     |  |        |     |  |
| 1                                                                                                                       | 332°32.8 | 150°47.1 | 35.5     | 244°13.5 | 37.9     | 201°14.7 | 32.8     | 318°06.7 | 23.5     |     |  |        |     |  |
| 2                                                                                                                       | 347°35.3 | 165°47.4 | 36.7     | 259°14.1 | 38.0     | 216°16.6 | 32.6     | 333°09.2 | 23.5     |     |  |        |     |  |
| 3                                                                                                                       | 2°37.7   | 180°47.7 | •• 38.0  | 274°14.7 | •• 38.0  | 231°18.5 | •• 32.5  | 348°11.7 | •• 23.4  |     |  |        |     |  |
| 4                                                                                                                       | 17°40.2  | 195°47.9 | 39.2     | 289°15.4 | 38.1     | 246°20.4 | 32.4     | 3°14.2   | 23.4     |     |  |        |     |  |
| 5                                                                                                                       | 32°42.7  | 210°48.2 | 40.4     | 304°16.0 | 38.1     | 261°22.3 | 32.2     | 18°16.7  | 23.4     |     |  |        |     |  |
| 6                                                                                                                       | 47°45.1  | 225°48.5 | S01°41.6 | 319°16.7 | N23°38.2 | 276°24.2 | N18°32.1 | 33°19.3  | N03°23.3 |     |  |        |     |  |
| 7                                                                                                                       | 62°47.6  | 240°48.8 | 42.8     | 334°17.3 | 38.2     | 291°26.1 | 31.9     | 48°21.8  | 23.3     |     |  |        |     |  |
| 8                                                                                                                       | 77°50.1  | 255°49.0 | 44.1     | 349°18.0 | 38.3     | 306°28.0 | 31.8     | 63°24.3  | 23.3     |     |  |        |     |  |
| 9                                                                                                                       | 92°52.5  | 270°49.3 | •• 45.3  | 4°18.6   | •• 38.3  | 321°29.9 | •• 31.7  | 78°26.8  | •• 23.2  |     |  |        |     |  |
| 10                                                                                                                      | 107°55.0 | 285°49.6 | 46.5     | 19°19.3  | 38.4     | 336°31.8 | 31.5     | 93°29.3  | 23.2     |     |  |        |     |  |
| 11                                                                                                                      | 122°57.4 | 300°49.9 | 47.7     | 34°19.9  | 38.4     | 351°33.7 | 31.4     | 108°31.8 | 23.2     |     |  |        |     |  |
| 12                                                                                                                      | 137°59.9 | 315°50.2 | S01°48.9 | 49°20.6  | N23°38.5 | 6°35.6   | N18°31.2 | 123°34.3 | N03°23.1 |     |  |        |     |  |
| 13                                                                                                                      | 153°02.4 | 330°50.4 | 50.1     | 64°21.2  | 38.5     | 21°37.5  | 31.1     | 138°36.8 | 23.1     |     |  |        |     |  |
| 14                                                                                                                      | 168°04.8 | 345°50.7 | 51.4     | 79°21.9  | 38.6     | 36°39.4  | 31.0     | 153°39.4 | 23.1     |     |  |        |     |  |
| 15                                                                                                                      | 183°07.3 | 0°51.0   | •• 52.6  | 94°22.5  | •• 38.6  | 51°41.3  | •• 30.8  | 168°41.9 | •• 23.0  |     |  |        |     |  |
| 16                                                                                                                      | 198°09.8 | 15°51.3  | 53.8     | 109°23.2 | 38.7     | 66°43.2  | 30.7     | 183°44.4 | 23.0     |     |  |        |     |  |
| 17                                                                                                                      | 213°12.2 | 30°51.6  | 55.0     | 124°23.8 | 38.7     | 81°45.1  | 30.5     | 198°46.9 | 23.0     |     |  |        |     |  |
| 18                                                                                                                      | 228°14.7 | 45°51.9  | S01°56.2 | 139°24.5 | N23°38.8 | 96°47.0  | N18°30.4 | 213°49.4 | N03°23.0 |     |  |        |     |  |
| 19                                                                                                                      | 243°17.2 | 60°52.1  | 57.4     | 154°25.1 | 38.8     | 111°49.0 | 30.2     | 228°51.9 | 22.9     |     |  |        |     |  |
| 20                                                                                                                      | 258°19.6 | 75°52.4  | 58.7     | 169°25.8 | 38.9     | 126°50.9 | 30.1     | 243°54.4 | 22.9     |     |  |        |     |  |
| 21                                                                                                                      | 273°22.1 | 90°52.7  | 01°59.9  | 184°26.4 | •• 38.9  | 141°52.8 | •• 30.0  | 258°57.0 | •• 22.9  |     |  |        |     |  |
| 22                                                                                                                      | 288°24.6 | 105°53.0 | 02°01.1  | 199°27.1 | 39.0     | 156°54.7 | 29.8     | 273°59.5 | 22.8     |     |  |        |     |  |
| 23                                                                                                                      | 303°27.0 | 120°53.3 | 02.3     | 214°27.7 | 39.0     | 171°56.6 | 29.7     | 289°02.0 | 22.8     |     |  |        |     |  |
| Mer.pass. 02:50 $\nu$ 0.3' d 1.2' m -4.35 $\nu$ 0.6' d 0.1' m 1.29 $\nu$ 1.9' d -0.1' m -1.78 $\nu$ 2.5' d -0.0' m 0.59 |          |          |          |          |          |          |          |          |          |     |  |        |     |  |

| Mon                                                                                                                     | GHA      | GHA      | Dec      | GHA      | Dec      | GHA      | Dec      | GHA      | Dec      |
|-------------------------------------------------------------------------------------------------------------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 0                                                                                                                       | 318°29.5 | 135°53.6 | S02°03.5 | 229°28.4 | N23°39.1 | 186°58.5 | N18°29.5 | 304°04.5 | N03°22.8 |
| 1                                                                                                                       | 333°31.9 | 150°53.8 | 04.7     | 244°29.0 | 39.1     | 202°00.4 | 29.4     | 319°07.0 | 22.7     |
| 2                                                                                                                       | 348°34.4 | 165°54.1 | 05.9     | 259°29.7 | 39.2     | 217°02.3 | 29.3     | 334°09.5 | 22.7     |
| 3                                                                                                                       | 3°36.9   | 180°54.4 | •• 07.2  | 274°30.3 | •• 39.2  | 232°04.2 | •• 29.1  | 349°12.1 | •• 22.7  |
| 4                                                                                                                       | 18°39.3  | 195°54.7 | 08.4     | 289°31.0 | 39.3     | 247°06.1 | 29.0     | 4°14.6   | 22.6     |
| 5                                                                                                                       | 33°41.8  | 210°55.0 | 09.6     | 304°31.6 | 39.3     | 262°08.0 | 28.8     | 19°17.1  | 22.6     |
| 6                                                                                                                       | 48°44.3  | 225°55.3 | S02°10.8 | 319°32.3 | N23°39.3 | 277°09.9 | N18°28.7 | 34°19.6  | N03°22.6 |
| 7                                                                                                                       | 63°46.7  | 240°55.6 | 12.0     | 334°32.9 | 39.4     | 292°11.8 | 28.5     | 49°22.1  | 22.5     |
| 8                                                                                                                       | 78°49.9  | 255°55.9 | 13.2     | 349°33.6 | 39.4     | 307°13.7 | 28.4     | 64°24.6  | 22.5     |
| 9                                                                                                                       | 93°51.7  | 270°56.2 | •• 14.5  | 4°34.2   | •• 39.5  | 322°15.6 | •• 28.3  | 79°27.1  | •• 22.5  |
| 10                                                                                                                      | 108°54.1 | 285°56.5 | 15.7     | 19°34.9  | 39.5     | 337°17.5 | 28.1     | 94°29.7  | 22.4     |
| 11                                                                                                                      | 123°56.6 | 300°56.8 | 16.9     | 34°35.5  | 39.6     | 352°19.4 | 28.0     | 109°32.2 | 22.4     |
| 12                                                                                                                      | 138°59.1 | 315°57.0 | S02°18.1 | 49°36.2  | N23°39.6 | 7°21.3   | N18°27.8 | 124°34.7 | N03°22.4 |
| 13                                                                                                                      | 154°01.5 | 330°57.3 | 19.3     | 64°36.8  | 39.6     | 22°23.2  | 27.7     | 139°37.2 | 22.3     |
| 14                                                                                                                      | 169°04.0 | 345°57.6 | 20.5     | 79°37.5  | 39.7     | 37°25.1  | 27.6     | 154°39.7 | 22.3     |
| 15                                                                                                                      | 184°06.4 | 0°57.9   | •• 21.7  | 94°38.1  | •• 39.7  | 52°27.0  | •• 27.4  | 169°42.3 | •• 22.3  |
| 16                                                                                                                      | 199°08.9 | 15°58.2  | 23.0     | 109°38.8 | 39.8     | 67°28.9  | 27.3     | 184°44.8 | 22.2     |
| 17                                                                                                                      | 214°11.4 | 30°58.5  | 24.2     | 124°39.5 | 39.8     | 82°30.8  | 27.1     | 199°47.3 | 22.2     |
| 18                                                                                                                      | 229°13.8 | 45°58.8  | S02°25.4 | 139°40.1 | N23°39.8 | 97°32.7  | N18°27.0 | 214°49.8 | N03°22.1 |
| 19                                                                                                                      | 244°16.3 | 60°59.1  | 26.6     | 154°40.8 | 39.9     | 112°34.6 | 26.8     | 229°52.3 | 22.1     |
| 20                                                                                                                      | 259°18.8 | 75°59.4  | 27.8     | 169°41.4 | 39.9     | 127°36.5 | 26.7     | 244°54.8 | 22.1     |
| 21                                                                                                                      | 274°21.2 | 90°59.7  | •• 29.0  | 184°42.1 | •• 40.0  | 142°38.4 | •• 26.6  | 259°57.4 | •• 22.0  |
| 22                                                                                                                      | 289°23.7 | 106°00.0 | 30.2     | 199°42.7 | 40.0     | 157°40.3 | 26.4     | 274°59.9 | 22.0     |
| 23                                                                                                                      | 304°26.2 | 121°00.3 | 31.4     | 214°43.4 | 40.0     | 172°42.3 | 26.3     | 290°02.4 | 22.0     |
| Mer.pass. 02:46 $\nu$ 0.3' d 1.2' m -4.36 $\nu$ 0.7' d 0.0' m 1.29 $\nu$ 1.9' d -0.1' m -1.78 $\nu$ 2.5' d -0.0' m 0.59 |          |          |          |          |          |          |          |          |          |

| Tue                                                                                                                     | GHA      | GHA      | Dec      | GHA      | Dec      | GHA      | Dec      | GHA      | Dec      |
|-------------------------------------------------------------------------------------------------------------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 0                                                                                                                       | 319°28.6 | 136°00.6 | S02°32.7 | 229°44.0 | N23°40.1 | 187°44.2 | N18°26.1 | 305°04.9 | N03°21.9 |
| 1                                                                                                                       | 334°31.1 | 151°00.9 | 33.9     | 244°44.7 | 40.1     | 202°46.1 | 26.0     | 320°07.4 | 21.9     |
| 2                                                                                                                       | 349°33.6 | 166°01.2 | 35.1     | 259°45.3 | 40.2     | 217°48.0 | 25.9     | 335°10.0 | 21.9     |
| 3                                                                                                                       | 4°36.0   | 181°01.5 | •• 36.3  | 274°46.0 | •• 40.2  | 232°49.9 | •• 25.7  | 350°12.5 | •• 21.8  |
| 4                                                                                                                       | 19°38.5  | 196°01.8 | 37.5     | 289°46.6 | 40.3     | 247°51.8 | 25.6     | 4°15.0   | 21.8     |
| 5                                                                                                                       | 34°40.9  | 211°02.1 | 38.7     | 304°47.3 | 40.3     | 262°53.7 | 25.4     | 20°17.5  | 21.8     |
| 6                                                                                                                       | 49°43.4  | 226°02.4 | S02°39.9 | 319°47.9 | N23°40.3 | 277°55.6 | N18°25.3 | 35°20.0  | N03°21.7 |
| 7                                                                                                                       | 64°45.9  | 241°02.7 | 41.1     | 334°48.6 | 40.3     | 292°57.5 | 25.1     | 50°22.6  | 21.7     |
| 8                                                                                                                       | 79°48.3  | 256°03.0 | 42.3     | 349°49.3 | 40.4     | 307°59.4 | 25.0     | 65°25.1  | 21.7     |
| 9                                                                                                                       | 94°50.8  | 271°03.3 | •• 43.6  | 4°49.9   | •• 40.4  | 323°01.3 | •• 24.9  | 80°27.6  | •• 21.6  |
| 10                                                                                                                      | 109°53.3 | 286°03.7 | 44.8     | 19°50.6  | 40.4     | 338°03.2 | 24.7     | 95°30.1  | 21.6     |
| 11                                                                                                                      | 124°55.7 | 301°04.0 | 46.0     | 34°51.2  | 40.5     | 353°05.1 | 24.6     | 110°32.6 | 21.6     |
| 12                                                                                                                      | 139°58.2 | 316°04.3 | S02°47.2 | 49°51.9  | N23°40.5 | 8°07.0   | N18°24.4 | 125°35.2 | N03°21.5 |
| 13                                                                                                                      | 155°00.7 | 331°04.6 | 48.6     | 64°52.5  | 40.5     | 23°08.9  | 24.3     | 140°37.7 | 21.5     |
| 14                                                                                                                      | 170°03.1 | 346°04.9 | 49.4     | 79°53.2  | 40.6     | 38°10.8  | 24.2     | 155°40.2 | 21.5     |
| 15                                                                                                                      | 185°05.6 | 1°05.2   | •• 50.8  | 94°53.8  | •• 40.6  | 53°12.7  | •• 24.0  | 170°42.7 | •• 21.4  |
| 16                                                                                                                      | 200°08.0 | 16°05.5  | 52.0     | 109°54.5 | 40.6     | 68°14.6  | 23.9     | 185°45.2 | 21.4     |
| 17                                                                                                                      | 215°10.5 | 31°05.8  | 53.2     | 124°55.2 | 40.7     | 83°16.5  | 23.7     | 200°47.8 | 21.3     |
| 18                                                                                                                      | 230°13.0 | 46°06.1  | S02°54.5 | 139°55.8 | N23°40.7 | 98°18.4  | N18°23.6 | 215°50.3 | N03°21.3 |
| 19                                                                                                                      | 245°15.4 | 61°06.4  | 55.7     | 154°56.5 | 40.7     | 113°20.3 | 23.4     | 230°52.8 | 21.3     |
| 20                                                                                                                      | 260°17.9 | 76°06.7  | 56.9     | 169°57.1 | 40.8     | 128°22.2 | 23.3     | 245°55.3 | 21.2     |
| 21                                                                                                                      | 275°20.4 | 91°07.1  | •• 58.1  | 184°57.8 | •• 40.8  | 143°24.2 | •• 23.2  | 260°57.8 | •• 21.2  |
| 22                                                                                                                      | 290°22.8 | 106°07.4 | 02°59.3  | 199°58.4 | 40.8     | 158°26.1 | 23.0     | 276°00.4 | 21.2     |
| 23                                                                                                                      | 305°25.3 | 121°07.7 | 03°00.5  | 214°59.1 | 40.9     | 173°28.0 | 22.9     | 291°02.9 | 21.1     |
| Mer.pass. 02:42 $\nu$ 0.3' d 1.2' m -4.37 $\nu$ 0.7' d 0.0' m 1.29 $\nu$ 1.9' d -0.1' m -1.79 $\nu$ 2.5' d -0.0' m 0.58 |          |          |          |          |          |          |          |          |          |

| Stars                   |          |          |
|-------------------------|----------|----------|
|                         | SHA      | Dec      |
| Alpheratz               | 357°33.1 | 29°14.3  |
| Ankaa                   | 353°05.6 | -42°09.4 |
| Schedar                 | 349°29.2 | 56°40.9  |
| Diphda                  | 348°45.8 | -17°50.2 |
| Achernar                | 335°19.0 | -57°05.7 |
| Hamal                   | 327°49.6 | 23°35.3  |
| Polaris                 | 313°21.2 | 89°22.2  |
| Acamar                  | 315°10.8 | -40°11.5 |
| Menkar                  | 314°04.8 | 4°11.8   |
| Mirfak                  | 308°26.4 | 49°57.2  |
| Aldebaran               | 290°38.2 | 16°33.8  |
| Rigel                   | 281°02.8 | -8°10.1  |
| Capella                 | 280°20.2 | 46°01.3  |
| Bellatrix               | 278°21.6 | 6°22.5   |
| Elnath                  | 278°00.4 | 28°37.7  |
| Anilam                  | 275°36.6 | -1°11.0  |
| Betelgeuse              | 270°50.9 | 7°24.8   |
| Canopus                 | 263°52.2 | -52°42.3 |
| Sirius                  | 258°25.3 | -16°45.0 |
| Adhara                  | 255°05.1 | -29°00.3 |
| Procyon                 | 244°49.7 | 5°09.5   |
| Pollux                  | 243°16.0 | 27°57.7  |
| Avior                   | 234°14.8 | -59°35.6 |
| Suhail                  | 222°45.8 | -43°32.4 |
| Miaplacidus             | 221°39.0 | -69°49.6 |
| Alphard                 | 217°46.8 | -8°46.4  |
| Regulus                 | 207°33.3 | 11°50.3  |
| Dubhe                   | 193°40.0 | 61°36.6  |
| Denebola                | 182°23.8 | 14°25.5  |
| Gienah                  | 175°42.4 | -17°41.4 |
| Acrux                   | 172°59.1 | -63°15.0 |
| Gacrux                  | 171°50.5 | -57°16.0 |
| Alloth                  | 166°12.1 | 55°49.1  |
| Spica                   | 158°21.0 | -13°18.0 |
| Alkaid                  | 152°51.1 | 49°11.1  |
| Hadar                   | 148°34.3 | -60°30.3 |
| Menkent                 | 147°56.1 | -36°30.2 |
| Arcturus                | 145°46.8 | 19°02.8  |
| Rigel Kent.             | 139°38.5 | -60°57.0 |
| Kochab                  | 137°19.9 | 74°03.0  |
| Zuben'ul                | 136°54.6 | -16°09.2 |
| Alphecca                | 126°02.6 | 26°37.7  |
| Antares                 | 112°14.1 | -26°29.5 |
| Atria                   | 107°06.8 | -69°04.7 |
| Sabik                   | 102°01.1 | -15°45.5 |
| Shaula                  | 96°08.3  | -37°07.4 |
| Rasalhague              | 95°57.1  | 12°32.6  |
| Eltanin                 | 90°41.2  | 51°29.3  |
| Kaus Aust.              | 83°30.4  | -34°22.3 |
| Vega                    | 80°32.0  | 38°48.7  |
| Nunki                   | 75°45.8  | -26°15.8 |
| Altair                  | 61°58.3  | 8°56.5   |
| Peacock                 | 53°03.1  | -56°38.9 |
| Deneb                   | 49°24.4  | 45°22.6  |
| Enif                    | 33°37.2  | 10°00.0  |
| Al Na'ir                | 27°30.8  | -46°49.7 |
| Fomalhaut               | 15°12.7  | -29°28.6 |
| Scheat                  | 13°43.6  | 28°13.7  |
| Markab                  | 13°28.3  | 15°21.0  |
| Aug 09 Sun SHA Mer-pass |          |          |
| Venus                   | 178°16.5 | 14:57    |
| Mars                    | 271°42.5 | 08:43    |
| Jupiter                 | 228°42.5 | 11:34    |
| Saturn                  | 345°33.8 | 03:47    |
| Aug 10 Mon SHA Mer-pass |          |          |
| Venus                   | 177°24.1 | 14:56    |
| Mars                    | 270°58.9 | 08:42    |
| Jupiter                 | 228°29.0 | 11:31</  |



| Aries           |          |  | Venus                     |          |  | Mars                     |          |  | Jupiter                    |          |  | Saturn                    |          |  |
|-----------------|----------|--|---------------------------|----------|--|--------------------------|----------|--|----------------------------|----------|--|---------------------------|----------|--|
| Wed             | GHA      |  | GHA                       | Dec      |  | GHA                      | Dec      |  | GHA                        | Dec      |  | GHA                       | Dec      |  |
| 0               | 320°27.8 |  | 136°08.0                  | S03°01.7 |  | 229°59.7                 | N23°40.9 |  | 188°29.9                   | N18°22.7 |  | 306°05.4                  | N03°21.1 |  |
| 1               | 335°30.2 |  | 151°08.3                  | 02.9     |  | 245°00.4                 | 40.9     |  | 203°31.8                   | 22.6     |  | 321°07.9                  | 21.1     |  |
| 2               | 350°32.7 |  | 166°08.6                  | 04.1     |  | 260°01.1                 | 40.9     |  | 218°33.7                   | 22.4     |  | 336°10.5                  | 21.0     |  |
| 3               | 5°35.2   |  | 181°09.0                  | 05.3     |  | 275°01.7                 | 41.0     |  | 233°35.6                   | 22.3     |  | 351°13.0                  | 21.0     |  |
| 4               | 20°37.6  |  | 196°09.3                  | 06.5     |  | 290°02.4                 | 41.0     |  | 248°37.5                   | 22.2     |  | 6°15.5                    | 21.0     |  |
| 5               | 35°40.1  |  | 211°09.6                  | 07.8     |  | 305°03.0                 | 41.0     |  | 263°39.4                   | 22.0     |  | 21°18.0                   | 20.9     |  |
| 6               | 50°42.5  |  | 226°09.9                  | S03°09.0 |  | 320°03.7                 | N23°41.3 |  | 278°41.3                   | N18°21.9 |  | 36°20.6                   | N03°20.9 |  |
| 7               | 65°45.0  |  | 241°10.2                  | 10.2     |  | 335°04.3                 | 41.1     |  | 293°43.2                   | 21.7     |  | 51°23.1                   | 20.8     |  |
| 8               | 80°47.5  |  | 256°10.5                  | 11.4     |  | 350°05.0                 | 41.1     |  | 308°45.1                   | 21.6     |  | 66°25.6                   | 20.8     |  |
| 9               | 95°49.9  |  | 271°10.9                  | 12.6     |  | 5°05.7                   | 41.1     |  | 323°47.0                   | 21.5     |  | 81°28.1                   | 20.8     |  |
| 10              | 110°52.4 |  | 286°11.2                  | 13.8     |  | 20°06.3                  | 41.2     |  | 338°48.9                   | 21.3     |  | 96°30.7                   | 20.7     |  |
| 11              | 125°54.9 |  | 301°11.5                  | 15.0     |  | 35°07.0                  | 41.2     |  | 353°50.8                   | 21.2     |  | 111°33.2                  | 20.7     |  |
| 12              | 140°57.3 |  | 316°11.8                  | S03°16.2 |  | 50°07.6                  | N23°41.2 |  | 8°52.7                     | N18°21.0 |  | 126°35.7                  | N03°20.7 |  |
| 13              | 155°59.8 |  | 331°12.2                  | 17.4     |  | 65°08.3                  | 41.2     |  | 23°54.6                    | 20.9     |  | 141°38.2                  | 20.6     |  |
| 14              | 171°02.3 |  | 346°12.5                  | 18.6     |  | 80°09.0                  | 41.3     |  | 38°56.5                    | 20.7     |  | 156°40.7                  | 20.6     |  |
| 15              | 186°04.7 |  | 1°12.8                    | 19.8     |  | 95°09.6                  | 41.3     |  | 53°58.5                    | 20.6     |  | 171°43.3                  | 20.5     |  |
| 16              | 201°07.2 |  | 16°13.1                   | 21.0     |  | 110°10.3                 | 41.3     |  | 69°00.4                    | 20.5     |  | 186°45.8                  | 20.5     |  |
| 17              | 216°09.7 |  | 31°13.4                   | 22.2     |  | 125°10.9                 | 41.3     |  | 84°02.3                    | 20.3     |  | 201°48.3                  | 20.5     |  |
| 18              | 231°12.1 |  | 46°13.8                   | S03°23.4 |  | 140°11.6                 | N23°41.4 |  | 99°04.2                    | N18°20.2 |  | 216°50.9                  | N03°20.4 |  |
| 19              | 246°14.6 |  | 61°14.1                   | 24.7     |  | 155°12.2                 | 41.4     |  | 114°06.1                   | 20.0     |  | 231°53.4                  | 20.4     |  |
| 20              | 261°17.0 |  | 76°14.4                   | 25.9     |  | 170°12.9                 | 41.4     |  | 129°08.0                   | 19.9     |  | 246°55.9                  | 20.4     |  |
| 21              | 276°19.5 |  | 91°14.8                   | 27.1     |  | 185°13.6                 | 41.4     |  | 144°09.9                   | 19.7     |  | 261°58.4                  | 20.3     |  |
| 22              | 291°22.0 |  | 106°15.1                  | 28.3     |  | 200°14.2                 | 41.5     |  | 159°11.8                   | 19.6     |  | 277°01.0                  | 20.3     |  |
| 23              | 306°24.4 |  | 121°15.4                  | 29.5     |  | 215°14.9                 | 41.5     |  | 174°13.7                   | 19.5     |  | 292°03.5                  | 20.2     |  |
| Mer.pass. 02:38 |          |  | $\nu$ 0.3° d 1.2' m -4.38 |          |  | $\nu$ 0.7° d 0.0' m 1.29 |          |  | $\nu$ 1.9° d -0.1' m -1.79 |          |  | $\nu$ 2.5° d -0.0' m 0.58 |          |  |

| Thu             | GHA      |  | GHA                       | Dec      |  | GHA                      | Dec      |  | GHA                        | Dec      |  | GHA                       | Dec      |  |
|-----------------|----------|--|---------------------------|----------|--|--------------------------|----------|--|----------------------------|----------|--|---------------------------|----------|--|
| 0               | 321°26.9 |  | 136°15.7                  | S03°30.7 |  | 230°15.5                 | N23°41.5 |  | 189°15.6                   | N18°19.3 |  | 307°06.0                  | N03°20.2 |  |
| 1               | 336°29.4 |  | 151°16.1                  | 31.9     |  | 245°16.2                 | 41.5     |  | 204°17.5                   | 19.2     |  | 322°08.5                  | 20.2     |  |
| 2               | 351°31.8 |  | 166°16.4                  | 33.1     |  | 260°16.9                 | 41.5     |  | 219°19.4                   | 19.0     |  | 337°11.1                  | 20.1     |  |
| 3               | 6°34.3   |  | 181°16.7                  | 34.3     |  | 275°17.5                 | 41.6     |  | 234°21.3                   | 18.9     |  | 352°13.6                  | 20.1     |  |
| 4               | 21°36.8  |  | 196°17.1                  | 35.5     |  | 290°18.2                 | 41.6     |  | 249°23.2                   | 18.7     |  | 7°16.1                    | 20.1     |  |
| 5               | 36°39.2  |  | 211°17.4                  | 36.7     |  | 305°18.8                 | 41.6     |  | 264°25.1                   | 18.6     |  | 22°18.6                   | 20.0     |  |
| 6               | 51°41.7  |  | 226°17.7                  | S03°37.9 |  | 320°19.5                 | N23°41.6 |  | 279°27.0                   | N18°18.5 |  | 37°21.2                   | N03°20.0 |  |
| 7               | 66°44.2  |  | 241°18.1                  | 39.1     |  | 335°20.2                 | 41.6     |  | 294°29.0                   | 18.3     |  | 52°23.7                   | 19.9     |  |
| 8               | 81°46.6  |  | 256°18.4                  | 40.3     |  | 350°20.8                 | 41.7     |  | 309°30.9                   | 18.2     |  | 67°26.2                   | 19.9     |  |
| 9               | 96°49.1  |  | 271°18.7                  | 41.5     |  | 5°21.5                   | 41.7     |  | 324°32.8                   | 18.0     |  | 82°28.8                   | 19.9     |  |
| 10              | 111°51.5 |  | 286°19.1                  | 42.7     |  | 20°22.2                  | 41.7     |  | 339°34.7                   | 17.9     |  | 97°31.3                   | 19.8     |  |
| 11              | 126°54.0 |  | 301°19.4                  | 43.9     |  | 35°22.8                  | 41.7     |  | 354°36.6                   | 17.7     |  | 112°33.8                  | 19.8     |  |
| 12              | 141°56.5 |  | 316°19.7                  | S03°45.1 |  | 50°23.5                  | N23°41.7 |  | 9°38.5                     | N18°17.6 |  | 127°36.3                  | N03°19.8 |  |
| 13              | 156°58.9 |  | 331°20.1                  | 46.3     |  | 65°24.1                  | 41.8     |  | 24°40.4                    | 17.5     |  | 142°38.9                  | 19.7     |  |
| 14              | 172°01.4 |  | 346°20.4                  | 47.5     |  | 80°24.8                  | 41.8     |  | 39°42.3                    | 17.3     |  | 157°41.4                  | 19.7     |  |
| 15              | 187°03.9 |  | 1°20.7                    | 48.7     |  | 95°25.5                  | 41.8     |  | 54°44.2                    | 17.2     |  | 172°43.9                  | 19.6     |  |
| 16              | 202°06.3 |  | 16°21.1                   | 49.9     |  | 110°26.1                 | 41.8     |  | 69°46.1                    | 17.0     |  | 187°46.5                  | 19.6     |  |
| 17              | 217°08.8 |  | 31°21.4                   | 51.1     |  | 125°26.8                 | 41.8     |  | 84°48.0                    | 16.9     |  | 202°49.0                  | 19.6     |  |
| 18              | 232°11.3 |  | 46°21.8                   | S03°52.3 |  | 140°27.5                 | N23°41.8 |  | 99°49.9                    | N18°16.7 |  | 217°51.5                  | N03°19.5 |  |
| 19              | 247°13.7 |  | 61°22.1                   | 53.5     |  | 155°28.1                 | 41.8     |  | 114°51.8                   | 16.6     |  | 232°54.0                  | 19.5     |  |
| 20              | 262°16.2 |  | 76°22.4                   | 54.7     |  | 170°28.8                 | 41.9     |  | 129°53.7                   | 16.5     |  | 247°56.6                  | 19.4     |  |
| 21              | 277°18.6 |  | 91°22.8                   | 55.9     |  | 185°29.4                 | 41.9     |  | 144°55.6                   | 16.3     |  | 262°59.1                  | 19.4     |  |
| 22              | 292°21.1 |  | 106°23.1                  | 57.1     |  | 200°30.1                 | 41.9     |  | 159°57.6                   | 16.2     |  | 278°01.6                  | 19.4     |  |
| 23              | 307°23.6 |  | 121°23.5                  | 58.3     |  | 215°30.8                 | 41.9     |  | 174°59.5                   | 16.0     |  | 293°04.2                  | 19.3     |  |
| Mer.pass. 02:34 |          |  | $\nu$ 0.3° d 1.2' m -4.40 |          |  | $\nu$ 0.7° d 0.0' m 1.29 |          |  | $\nu$ 1.9° d -0.1' m -1.79 |          |  | $\nu$ 2.5° d -0.0' m 0.57 |          |  |

| Fri             | GHA      |  | GHA                       | Dec      |  | GHA                      | Dec      |  | GHA                        | Dec      |  | GHA                       | Dec      |  |
|-----------------|----------|--|---------------------------|----------|--|--------------------------|----------|--|----------------------------|----------|--|---------------------------|----------|--|
| 0               | 322°26.0 |  | 136°23.8                  | S03°59.5 |  | 230°31.4                 | N23°41.9 |  | 190°01.4                   | N18°15.9 |  | 308°06.7                  | N03°19.3 |  |
| 1               | 337°28.5 |  | 151°24.2                  | 04°00.7  |  | 245°32.1                 | 41.9     |  | 205°03.3                   | 15.7     |  | 323°09.2                  | 19.3     |  |
| 2               | 352°31.0 |  | 166°24.5                  | 01.9     |  | 260°32.8                 | 41.9     |  | 220°05.2                   | 15.6     |  | 338°11.8                  | 19.2     |  |
| 3               | 7°33.4   |  | 181°24.9                  | 03.1     |  | 275°33.4                 | 42.0     |  | 235°07.1                   | 15.5     |  | 353°14.3                  | 19.1     |  |
| 4               | 22°35.2  |  | 196°25.2                  | 04.3     |  | 290°34.1                 | 42.0     |  | 250°09.0                   | 15.3     |  | 6°16.1                    | 19.1     |  |
| 5               | 37°38.4  |  | 211°25.5                  | 05.5     |  | 305°34.7                 | 42.0     |  | 265°10.9                   | 15.2     |  | 23°19.3                   | 19.1     |  |
| 6               | 52°40.8  |  | 226°25.9                  | S04°06.7 |  | 320°35.4                 | N23°42.0 |  | 280°12.8                   | N18°15.0 |  | 38°21.9                   | N03°19.1 |  |
| 7               | 67°43.3  |  | 241°26.2                  | 07.9     |  | 335°36.1                 | 42.0     |  | 295°14.7                   | 14.9     |  | 53°24.4                   | 19.0     |  |
| 8               | 82°45.8  |  | 256°26.6                  | 09.1     |  | 350°36.7                 | 42.0     |  | 310°16.6                   | 14.7     |  | 68°26.9                   | 19.0     |  |
| 9               | 97°48.2  |  | 271°26.9                  | 10.3     |  | 5°37.4                   | 42.0     |  | 325°18.5                   | 14.5     |  | 83°29.5                   | 18.9     |  |
| 10              | 112°50.7 |  | 286°27.3                  | 11.5     |  | 20°38.1                  | 42.0     |  | 340°20.4                   | 14.5     |  | 98°32.0                   | 18.9     |  |
| 11              | 127°53.1 |  | 301°27.6                  | 12.7     |  | 35°38.7                  | 42.0     |  | 355°22.4                   | 14.3     |  | 113°34.5                  | 18.9     |  |
| 12              | 142°55.6 |  | 316°28.0                  | S04°13.9 |  | 50°39.4                  | N23°42.1 |  | 10°24.3                    | N18°14.2 |  | 128°37.1                  | N03°18.8 |  |
| 13              | 157°58.1 |  | 331°28.3                  | 15.1     |  | 65°40.1                  | 42.1     |  | 25°26.2                    | 14.0     |  | 143°39.6                  | 18.8     |  |
| 14              | 173°00.5 |  | 346°28.7                  | 16.3     |  | 80°40.7                  | 42.1     |  | 40°28.1                    | 13.9     |  | 158°42.1                  | 18.7     |  |
| 15              | 188°03.0 |  | 1°29.0                    | 17.5     |  | 95°41.4                  | 42.1     |  | 55°30.0                    | 13.7     |  | 173°44.7                  | 18.7     |  |
| 16              | 203°05.5 |  | 16°29.4                   | 18.7     |  | 110°42.1                 | 42.1     |  | 70°31.9                    | 13.6     |  | 188°47.2                  | 18.7     |  |
| 17              | 218°07.9 |  | 31°29.8                   | 19.9     |  | 125°42.7                 | 42.1     |  | 85°33.8                    | 13.5     |  | 203°49.7                  | 18.6     |  |
| 18              | 233°10.4 |  | 46°30.1                   | S04°21.1 |  | 140°43.4                 | N23°42.1 |  | 100°35.7                   | N18°13.3 |  | 218°52.3                  | N03°18.6 |  |
| 19              | 248°12.9 |  | 61°30.5                   | 22.3     |  | 155°44.1                 | 42.1     |  | 115°37.6                   | 13.2     |  | 233°54.8                  | 18.5     |  |
| 20              | 263°15.3 |  | 76°30.8                   | 23.5     |  | 170°44.7                 | 42.1     |  | 130°39.5                   | 13.0     |  | 248°57.3                  | 18.5     |  |
| 21              | 278°17.8 |  | 91°31.2                   | 24.7     |  | 185°45.4                 | 42.1     |  | 145°41.4                   | 12.9     |  | 263°59.9                  | 18.5     |  |
| 22              | 293°20.2 |  | 106°31.5                  | 25.9     |  | 200°46.1                 | 42.1     |  | 160°43.3                   | 12.7     |  | 279°02.4                  | 18.4     |  |
| 23              | 308°22.7 |  | 121°31.9                  | 27.1     |  | 215°46.7                 | 42.1     |  | 175°45.3                   | 12.6     |  | 294°04.9                  | 18.4     |  |
| Mer.pass. 02:30 |          |  | $\nu$ 0.3° d 1.2' m -4.41 |          |  | $\nu$ 0.7° d 0.0' m 1.28 |          |  | $\nu$ 1.9° d -0.1' m -1.79 |          |  | $\nu$ 2.5° d -0.0' m 0.57 |          |  |

| Stars               |          |            |
|---------------------|----------|------------|
|                     | SHA      | Dec        |
| Alpheratz           | 357°33.1 | 29°14.3    |
| Ankaa               | 353°05.5 | -42°09.4   |
| Schedar             | 349°29.1 | -56°40.9   |
| Diphda              | 348°45.7 | -17°50.2   |
| Achernar            | 335°18.9 | -57°05.7   |
| Hamel               | 327°49.6 | -23°35.3   |
| Polaris             | 313°19.6 | 89°22.3    |
| Acamar              | 315°10.7 | -40°11.5   |
| Menkar              | 314°04.7 | 4°11.8     |
| Mirfak              | 308°26.4 | 49°57.2    |
| Aldebaran           | 290°38.2 | 16°33.8    |
| Rigel               | 281°02.7 | -8°10.1    |
| Capella             | 280°20.1 | 46°01.3    |
| Bellatrix           | 278°21.6 | 6°22.5     |
| Elnath              | 278°00.4 | 28°37.7    |
| Anilam              | 275°36.6 | -1°11.0    |
| Betelgeuse          | 270°50.8 | 7°24.8     |
| Canopus             | 263°52.2 | -52°42.3   |
| Sirius              | 258°25.3 | -16°45.0   |
| Adhara              | 255°05.1 | -29°00.3   |
| Procyon             | 244°49.7 | 5°09.5     |
| Pollux              | 243°16.0 | 27°57.7    |
| Avior               | 234°14.8 | -59°35.6   |
| Suhail              | 222°45.8 | -43°32.3   |
| Miaplacidus         | 221°39.0 | -69°49.5   |
| Alphard             | 217°46.8 | -8°46.4    |
| Regulus             | 207°33.3 | 11°50.3    |
| Dubhe               | 193°40.0 | 61°36.6    |
| Denebola            | 182°23.8 | 14°25.5    |
| Gienah              | 175°42.4 | -17°41.4   |
| Acrux               | 172°59.1 | -63°15.0   |
| Gacrux              | 171°50.5 | -57°15.9   |
| Alioth              | 166°12.1 | 55°49.1    |
| Spica               | 158°21.0 | -11°18.0   |
| Alkaid              | 152°51.1 | 49°11.0    |
| Hadar               | 148°34.3 | -60°30.3   |
| Menkent             | 147°56.1 | -36°30.2   |
| Arcturus            | 145°46.8 | 19°02.8    |
| Rigel Kent.         | 138°38.0 | -60°57.0   |
| Kochab              | 137°19.9 | 74°03.0    |
| Zuben'ubi           | 136°54.6 | -16°09.2   |
| Alphecca            | 126°02.6 | -26°37.7   |
| Antares             | 112°14.1 | -26°29.5   |
| Atria               | 107°06.8 | -69°04.7   |
| Shaula              | 102°05.1 | -37°07.4   |
| Sabik               | 96°08.3  | -37°07.4   |
| Rasalhague          | 95°57.1  | 12°32.6    |
| Eltanin             | 90°41.2  | 51°29.3    |
| Kaus Aust.          | 83°30.4  | -34°22.3   |
| Vega                | 80°32.0  | 38°48.7    |
| Nunki               | 75°45.8  | -26°15.8   |
| Altair              | 61°58.3  | 8°56.5     |
| Peacock             | 53°03.0  | -56°38.9   |
| Deneb               | 49°24.4  | 45°22.6    |
| Enif                | 33°37.2  | 10°00.0    |
| Fomalhaut           | 27°30.8  | -46°49.7   |
| Al Na'ir            | 15°12.7  | -29°28.6   |
| Scheat              | 13°51.6  | 28°13.7    |
| Markab              | 13°28.3  | 15°21.0    |
| <hr/>               |          |            |
| Aug 12 Wed          | SHA      | Mer. pass. |
| Venus               | 175°40.2 | 14:55      |
| Mars                | 269°32.0 | 08:40      |
| Jupiter             | 228°02.1 | 11:25      |
| Saturn              | 345°37.7 | 03:35      |
| <hr/>               |          |            |
| Aug 13 Thu          | SHA      |            |
| Venus               | 174°48.8 | 14:55      |
| Mars                | 268°48.6 | 08:39      |
| Jupiter             | 227°48.7 | 11:22      |
| Saturn              | 345°39.1 | 03:31      |
| <hr/>               |          |            |
| Aug 14 Fri          | SHA      | Mer. pass. |
| Venus               | 173°57.8 | 14:54      |
| Mars                | 268°05.4 | 08:38      |
| Jupiter             | 227°35.3 | 11:18      |
| Saturn              | 345°40.7 | 03:27      |
| <hr/>               |          |            |
| Horizontal parallax |          |            |
| Venus:              | 0.2      |            |
| Mars:               | 0.1      |            |

| Aries           |          |          | Venus                     |          |          | Mars                     |          |          | Jupiter                    |     |  | Saturn                    |     |  |
|-----------------|----------|----------|---------------------------|----------|----------|--------------------------|----------|----------|----------------------------|-----|--|---------------------------|-----|--|
| Sat             | GHA      |          | GHA                       | Dec      |          | GHA                      | Dec      |          | GHA                        | Dec |  | GHA                       | Dec |  |
| 0               | 323°25.2 | 136°32.3 | S04°28.3                  | 230°47.4 | N23°42.1 | 190°47.2                 | 118°12.5 | 309°07.5 | N03°18.3                   |     |  |                           |     |  |
| 1               | 338°27.6 | 151°32.6 | 29.5                      | 245°48.1 | 42.1     | 205°49.1                 | 12.3     | 324°10.0 | 18.3                       |     |  |                           |     |  |
| 2               | 353°30.1 | 166°33.0 | 30.7                      | 260°48.7 | 42.2     | 220°51.0                 | 12.2     | 339°12.5 | 18.3                       |     |  |                           |     |  |
| 3               | 8°32.6   | 181°33.3 | .. 31.9                   | 275°49.4 | .. 42.2  | 235°52.9                 | .. 12.0  | 354°15.1 | .. 18.2                    |     |  |                           |     |  |
| 4               | 23°35.0  | 196°33.7 | 33.1                      | 290°50.1 | 42.2     | 250°54.8                 | 11.9     | 9°17.6   | 18.2                       |     |  |                           |     |  |
| 5               | 38°37.5  | 211°34.1 | 34.3                      | 305°50.7 | 42.2     | 265°56.7                 | 11.7     | 24°20.1  | 18.1                       |     |  |                           |     |  |
| 6               | 53°40.0  | 226°34.4 | S04°35.5                  | 320°51.4 | N23°42.2 | 280°58.6                 | N18°11.6 | 39°22.7  | N03°18.1                   |     |  |                           |     |  |
| 7               | 68°42.4  | 241°34.8 | 36.7                      | 335°52.1 | 42.2     | 296°00.5                 | 11.5     | 54°25.2  | 18.0                       |     |  |                           |     |  |
| 8               | 83°44.9  | 256°35.1 | 37.9                      | 350°52.7 | 42.2     | 311°02.4                 | 11.3     | 69°27.7  | 18.0                       |     |  |                           |     |  |
| 9               | 98°47.4  | 271°35.5 | .. 39.0                   | 5°53.4   | .. 42.2  | 326°04.3                 | .. 11.2  | 84°30.3  | .. 18.0                    |     |  |                           |     |  |
| 10              | 113°49.8 | 286°35.9 | 40.2                      | 20°54.1  | 42.2     | 341°06.3                 | 11.0     | 99°32.8  | 17.9                       |     |  |                           |     |  |
| 11              | 128°52.3 | 301°36.2 | 41.4                      | 35°54.7  | 42.2     | 356°08.2                 | 10.9     | 114°35.3 | 17.9                       |     |  |                           |     |  |
| 12              | 143°54.7 | 316°36.6 | S04°42.6                  | 50°55.4  | N23°42.2 | 11°10.1                  | N18°10.7 | 129°37.9 | N03°17.8                   |     |  |                           |     |  |
| 13              | 158°57.2 | 331°37.0 | 43.8                      | 65°56.1  | 42.2     | 26°12.0                  | 10.6     | 144°40.4 | 17.8                       |     |  |                           |     |  |
| 14              | 173°59.7 | 346°37.3 | 45.0                      | 80°56.8  | 42.2     | 41°13.9                  | 10.4     | 159°43.0 | 17.8                       |     |  |                           |     |  |
| 15              | 189°02.1 | 1°37.7   | .. 46.2                   | 95°57.4  | .. 42.2  | 56°15.8                  | .. 10.3  | 174°45.5 | .. 17.7                    |     |  |                           |     |  |
| 16              | 204°04.6 | 16°38.1  | .. 47.4                   | 110°58.1 | 42.2     | 71°17.7                  | 10.2     | 189°48.0 | 17.7                       |     |  |                           |     |  |
| 17              | 219°07.1 | 31°38.5  | 48.6                      | 125°58.8 | 42.2     | 86°19.6                  | 10.0     | 204°50.6 | 17.6                       |     |  |                           |     |  |
| 18              | 234°09.5 | 46°38.8  | S04°49.8                  | 140°59.4 | N23°42.2 | 101°21.5                 | N18°09.9 | 219°53.1 | N03°17.6                   |     |  |                           |     |  |
| 19              | 249°12.0 | 61°39.2  | 51.0                      | 156°00.1 | 42.2     | 116°23.4                 | 09.7     | 234°55.6 | 17.6                       |     |  |                           |     |  |
| 20              | 264°14.5 | 76°39.6  | 52.2                      | 171°00.8 | 42.2     | 131°25.3                 | 09.6     | 249°58.2 | 17.5                       |     |  |                           |     |  |
| 21              | 279°16.9 | 91°39.9  | .. 53.4                   | 186°01.4 | .. 42.2  | 146°27.3                 | .. 09.4  | 265°00.7 | .. 17.5                    |     |  |                           |     |  |
| 22              | 294°19.4 | 106°40.3 | 54.0                      | 201°02.1 | 42.2     | 161°29.2                 | 09.3     | 280°03.2 | 17.4                       |     |  |                           |     |  |
| 23              | 309°21.8 | 121°40.7 | 55.7                      | 216°02.8 | 42.2     | 176°31.1                 | 09.2     | 295°05.8 | 17.4                       |     |  |                           |     |  |
| Mer.pass. 02:26 |          |          | $\nu$ 0.4' d 1.2' m -4.42 |          |          | $\nu$ 0.7' d 0.0' m 1.28 |          |          | $\nu$ 1.9' d -0.1' m -1.79 |     |  | $\nu$ 2.5' d -0.0' m 0.56 |     |  |

| Sun                                                                                                                      | GHA      | GHA      | Dec      | GHA      | Dec      | GHA      | Dec      | GHA      | Dec      |
|--------------------------------------------------------------------------------------------------------------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 0                                                                                                                        | 324°24.3 | 136°41.1 | S04°56.9 | 231°03.5 | N23°42.2 | 191°33.0 | N18°09.0 | 310°08.3 | N03°17.3 |
| 1                                                                                                                        | 339°26.8 | 151°41.4 | 58.1     | 246°04.1 | 42.2     | 206°34.9 | 08.9     | 325°10.9 | 17.3     |
| 2                                                                                                                        | 354°29.2 | 166°41.8 | 04°59.3  | 261°04.8 | 42.2     | 221°36.8 | 08.7     | 340°13.4 | 17.3     |
| 3                                                                                                                        | 9°31.7   | 181°42.2 | 05°00.5  | 276°05.5 | .. 42.2  | 236°38.7 | .. 08.6  | 355°15.9 | .. 17.2  |
| 4                                                                                                                        | 24°34.2  | 196°42.6 | 01.7     | 291°06.1 | 42.2     | 251°40.6 | 08.4     | 10°18.5  | 17.2     |
| 5                                                                                                                        | 39°36.6  | 211°42.9 | 02.9     | 306°06.8 | 42.2     | 266°42.5 | 08.3     | 25°21.0  | 17.1     |
| 6                                                                                                                        | 54°39.1  | 226°43.3 | S05°04.1 | 321°07.5 | N23°42.2 | 281°44.4 | N18°08.1 | 40°23.6  | N03°17.1 |
| 7                                                                                                                        | 69°41.6  | 241°43.7 | 05.3     | 336°08.2 | 42.1     | 296°46.4 | 08.0     | 55°26.1  | 17.0     |
| 8                                                                                                                        | 84°44.0  | 256°44.1 | 06.4     | 351°08.8 | 42.1     | 311°48.3 | 07.9     | 70°28.6  | 17.0     |
| 9                                                                                                                        | 99°46.5  | 271°44.5 | .. 07.6  | 6°09.5   | .. 42.1  | 326°50.2 | .. 07.7  | 85°31.2  | .. 17.0  |
| 10                                                                                                                       | 114°49.0 | 286°44.8 | 08.8     | 21°10.2  | 42.1     | 341°52.1 | 07.6     | 100°33.7 | 16.9     |
| 11                                                                                                                       | 129°51.4 | 301°45.2 | 10.0     | 36°10.8  | 42.1     | 356°54.0 | 07.4     | 115°36.2 | 16.9     |
| 12                                                                                                                       | 144°53.9 | 316°45.6 | S05°11.2 | 51°11.5  | N23°42.1 | 11°55.9  | N18°07.3 | 130°38.8 | N03°16.8 |
| 13                                                                                                                       | 159°56.3 | 331°46.0 | 12.4     | 66°12.2  | 42.1     | 26°57.8  | 07.1     | 145°41.3 | 16.8     |
| 14                                                                                                                       | 174°58.8 | 346°46.4 | 13.6     | 81°12.9  | 42.1     | 41°59.7  | 07.0     | 160°43.9 | 16.8     |
| 15                                                                                                                       | 190°01.3 | 1°46.7   | .. 14.8  | 96°13.5  | .. 42.1  | 57°01.6  | .. 06.9  | 175°46.4 | .. 16.7  |
| 16                                                                                                                       | 205°03.7 | 16°47.1  | 15.9     | 111°14.2 | 42.1     | 72°03.5  | 06.7     | 190°48.9 | 16.7     |
| 17                                                                                                                       | 220°06.2 | 31°47.5  | 17.1     | 126°14.9 | 42.1     | 87°05.5  | 06.6     | 205°51.5 | 16.6     |
| 18                                                                                                                       | 235°08.7 | 46°47.9  | S05°18.3 | 141°15.6 | N23°42.1 | 102°07.4 | N18°06.4 | 220°54.0 | N03°16.6 |
| 19                                                                                                                       | 250°11.1 | 61°48.3  | 19.5     | 156°16.2 | 42.1     | 117°09.3 | 06.3     | 235°56.6 | 16.5     |
| 20                                                                                                                       | 265°13.6 | 76°48.7  | 20.7     | 171°16.9 | 42.1     | 132°11.2 | 06.1     | 250°59.1 | 16.5     |
| 21                                                                                                                       | 280°16.1 | 91°49.1  | .. 21.9  | 186°17.6 | .. 42.0  | 147°13.1 | .. 06.0  | 266°01.6 | .. 16.5  |
| 22                                                                                                                       | 295°18.5 | 106°49.5 | 23.1     | 201°18.3 | 42.0     | 162°15.0 | 05.8     | 281°04.2 | 16.4     |
| 23                                                                                                                       | 310°21.0 | 121°49.8 | 24.2     | 216°18.9 | 42.0     | 177°16.9 | 05.7     | 296°06.7 | 16.4     |
| Mer.pass. 02:22 $\nu$ 0.4' d 1.2' m -4.43 $\nu$ 0.7' d -0.0' m 1.28 $\nu$ 1.9' d -0.1' m -1.79 $\nu$ 2.5' d -0.0' m 0.56 |          |          |          |          |          |          |          |          |          |

| Mon             | GHA      | GHA      | Dec                       | GHA      | Dec      | GHA                       | Dec      | GHA      | Dec                        |  |  |                           |  |  |
|-----------------|----------|----------|---------------------------|----------|----------|---------------------------|----------|----------|----------------------------|--|--|---------------------------|--|--|
| 0               | 325°23.5 | 136°50.2 | S05°25.4                  | 231°19.6 | N23°42.0 | 192°18.8                  | N18°05.6 | 311°09.3 | N03°16.3                   |  |  |                           |  |  |
| 1               | 340°25.9 | 151°50.6 | 26.6                      | 246°20.3 | 42.0     | 207°20.7                  | 05.4     | 326°11.8 | 16.3                       |  |  |                           |  |  |
| 2               | 355°28.4 | 166°51.0 | 27.8                      | 261°20.9 | 42.0     | 222°22.7                  | 05.3     | 341°14.4 | 16.2                       |  |  |                           |  |  |
| 3               | 10°30.8  | 181°51.4 | .. 29.0                   | 276°21.6 | .. 42.0  | 237°24.6                  | .. 05.1  | 356°16.9 | .. 16.2                    |  |  |                           |  |  |
| 4               | 25°33.3  | 196°51.8 | 30.2                      | 291°22.3 | 42.0     | 252°26.5                  | 05.0     | 11°19.4  | 16.1                       |  |  |                           |  |  |
| 5               | 40°35.8  | 211°52.2 | 31.3                      | 306°23.0 | 42.0     | 267°28.4                  | 04.8     | 26°22.0  | 16.1                       |  |  |                           |  |  |
| 6               | 55°38.2  | 226°52.6 | S05°32.5                  | 321°23.7 | N23°41.9 | 282°30.3                  | N18°04.7 | 41°24.5  | N03°16.1                   |  |  |                           |  |  |
| 7               | 70°40.7  | 241°53.0 | 33.7                      | 336°24.3 | 41.9     | 297°32.2                  | 04.5     | 56°27.1  | 16.0                       |  |  |                           |  |  |
| 8               | 85°43.2  | 256°53.4 | 34.9                      | 351°25.0 | 41.9     | 312°34.1                  | 04.4     | 71°29.6  | 16.0                       |  |  |                           |  |  |
| 9               | 100°45.6 | 271°53.8 | .. 36.1                   | 6°25.7   | .. 41.9  | 327°36.0                  | .. 04.3  | 86°32.1  | .. 15.9                    |  |  |                           |  |  |
| 10              | 115°48.1 | 286°54.2 | 37.3                      | 21°26.4  | 41.9     | 342°37.9                  | 04.1     | 101°34.7 | 15.9                       |  |  |                           |  |  |
| 11              | 130°50.6 | 301°54.6 | 38.4                      | 36°27.0  | 41.9     | 357°39.9                  | 04.0     | 116°37.2 | 15.8                       |  |  |                           |  |  |
| 12              | 145°53.0 | 316°55.0 | S05°39.6                  | 51°27.7  | N23°41.9 | 12°41.8                   | N18°03.8 | 131°39.8 | N03°15.8                   |  |  |                           |  |  |
| 13              | 160°55.5 | 331°55.4 | 40.8                      | 66°28.4  | 41.9     | 27°43.7                   | 03.7     | 146°42.3 | 15.8                       |  |  |                           |  |  |
| 14              | 175°57.9 | 346°55.8 | 42.0                      | 81°29.1  | 41.8     | 42°45.6                   | 03.5     | 161°44.9 | 15.7                       |  |  |                           |  |  |
| 15              | 191°00.4 | 1°56.2   | .. 43.2                   | 96°29.7  | .. 41.8  | 57°47.5                   | .. 03.4  | 176°47.4 | .. 15.7                    |  |  |                           |  |  |
| 16              | 206°02.9 | 16°56.6  | 44.3                      | 111°30.4 | 41.8     | 72°49.4                   | 03.3     | 191°50.0 | 15.6                       |  |  |                           |  |  |
| 17              | 221°05.3 | 31°57.0  | 45.5                      | 126°31.1 | 41.8     | 87°51.3                   | 03.1     | 206°52.5 | 15.6                       |  |  |                           |  |  |
| 18              | 236°07.8 | 46°57.4  | S05°46.7                  | 141°31.8 | N23°41.8 | 102°53.2                  | N18°03.0 | 221°55.0 | N03°15.5                   |  |  |                           |  |  |
| 19              | 251°10.3 | 61°57.8  | 47.9                      | 156°32.4 | 41.8     | 117°55.2                  | 02.8     | 236°57.6 | 15.5                       |  |  |                           |  |  |
| 20              | 266°12.7 | 76°58.2  | 49.1                      | 171°33.1 | 41.7     | 132°57.1                  | 02.7     | 252°00.1 | 15.4                       |  |  |                           |  |  |
| 21              | 281°15.2 | 91°58.6  | .. 50.2                   | 186°33.8 | .. 41.7  | 147°59.0                  | .. 02.5  | 267°02.7 | .. 15.4                    |  |  |                           |  |  |
| 22              | 296°17.7 | 106°59.0 | 51.4                      | 201°34.5 | 41.7     | 163°00.9                  | 02.4     | 282°05.2 | 15.4                       |  |  |                           |  |  |
| 23              | 311°20.1 | 121°59.4 | 52.6                      | 216°35.2 | 41.7     | 178°02.8                  | 02.2     | 297°07.8 | 15.3                       |  |  |                           |  |  |
| Mer.pass. 02:18 |          |          | $\nu$ 0.4' d 1.2' m -4.44 |          |          | $\nu$ 0.7' d -0.0' m 1.28 |          |          | $\nu$ 1.9' d -0.1' m -1.79 |  |  | $\nu$ 2.5' d -0.0' m 0.55 |  |  |

| Stars               |          |          |
|---------------------|----------|----------|
|                     | SHA      | Dec      |
| Alpheratz           | 357°33.1 | 29°14.3  |
| Ankaa               | 353°05.5 | -42°09.4 |
| Schedar             | 349°29.1 | 56°40.9  |
| Diphda              | 348°45.7 | -17°50.2 |
| Achernar            | 335°18.9 | -57°05.7 |
| Hamal               | 327°49.6 | 23°35.3  |
| Polaris             | 313°18.2 | 89°22.3  |
| Acamar              | 315°10.7 | -40°11.5 |
| Menkar              | 311°04.7 | 4°11.8   |
| Mirfak              | 308°26.3 | 49°57.2  |
| Aldebaran           | 290°38.2 | 16°33.8  |
| Rigel               | 281°02.7 | -8°10.1  |
| Capella             | 280°20.1 | 46°01.3  |
| Bellatrix           | 278°21.6 | 6°22.5   |
| Elnath              | 278°00.4 | 28°37.7  |
| Anilam              | 275°36.5 | -1°11.0  |
| Betelgeuse          | 270°50.8 | 7°24.8   |
| Canopus             | 263°52.2 | -52°42.3 |
| Sirius              | 258°25.3 | -16°45.0 |
| Adhara              | 255°05.1 | -29°00.3 |
| Procyon             | 244°49.7 | 5°09.5   |
| Pollux              | 243°16.0 | 27°57.7  |
| Avior               | 234°14.8 | -59°35.5 |
| Suhail              | 222°45.8 | -43°32.3 |
| Miaplacidus         | 221°39.0 | -69°49.5 |
| Alphard             | 217°46.8 | -8°46.4  |
| Regulus             | 207°33.3 | 11°50.3  |
| Dubhe               | 193°40.0 | 61°36.6  |
| Denebola            | 182°23.9 | 14°25.5  |
| Gienah              | 175°42.5 | -17°41.4 |
| Acrux               | 172°59.1 | -63°15.0 |
| Gacrux              | 171°50.6 | -57°15.9 |
| Alloth              | 166°12.1 | 55°49.1  |
| Spica               | 158°21.0 | -13°18.0 |
| Alkaid              | 152°51.1 | 49°11.0  |
| Hadar               | 148°34.3 | -60°30.3 |
| Menkent             | 147°56.2 | -36°30.2 |
| Arcturus            | 145°46.8 | 19°02.8  |
| Rigel Kent.         | 139°38.6 | -60°57.0 |
| Kochab              | 137°20.0 | 74°03.0  |
| Zuben'ubi           | 136°54.6 | -16°09.2 |
| Alphecca            | 126°02.6 | 26°37.7  |
| Antares             | 112°14.1 | -26°29.5 |
| Atria               | 107°06.9 | -69°04.7 |
| Sabik               | 102°01.1 | -15°45.5 |
| Shaula              | 96°08.3  | -37°07.4 |
| Rasalhague          | 95°57.1  | 12°32.6  |
| Eltanin             | 90°41.2  | 51°29.3  |
| Kaus Aust.          | 83°30.5  | -34°22.3 |
| Vega                | 80°32.0  | 38°48.7  |
| Nunki               | 75°45.8  | -26°15.8 |
| Altair              | 61°58.4  | 8°56.5   |
| Peacock             | 53°03.0  | -56°38.9 |
| Deneb               | 49°24.4  | 45°22.6  |
| Enif                | 33°37.2  | 10°00.0  |
| Al Na'ir            | 27°30.8  | -46°49.7 |
| Fomalhaut           | 15°12.7  | -29°28.7 |
| Scheat              | 13°43.6  | 28°13.7  |
| Makab               | 13°28.3  | 15°21.0  |
| <hr/>               |          |          |
| Aug 15 Sat          | SHA      | Mer.pass |
| Venus               | 173°07.1 | 14:53    |
| Mars                | 267°22.2 | 08:36    |
| Jupiter             | 227°22.0 | 11:15    |
| Saturn              | 345°42.3 | 03:23    |
| <hr/>               |          |          |
| Aug 16 Sun          | SHA      | Mer.pass |
| Venus               | 172°16.7 | 14:53    |
| Mars                | 266°39.1 | 08:35    |
| Jupiter             | 227°08.7 | 11:12    |
| Saturn              | 345°44.0 | 03:19    |
| <hr/>               |          |          |
| Aug 17 Mon          | SHA      | Mer.pass |
| Venus               | 171°26.8 | 14:52    |
| Mars                | 265°56.1 | 08:34    |
| Jupiter             | 226°55.4 | 11:09    |
| Saturn              | 345°45.8 | 03:15    |
| <hr/>               |          |          |
| Horizontal parallax |          |          |
| Venus:              |          | 0.2      |
| Mars:               |          | 0.1      |

August 18, 19, 20 UT (Tue., Wed., Thu.)

|                 | Aries    |          |                           | Venus    |          |                           | Mars     |          |                            | Jupiter |     |                           | Saturn |  |  |
|-----------------|----------|----------|---------------------------|----------|----------|---------------------------|----------|----------|----------------------------|---------|-----|---------------------------|--------|--|--|
| Tue             | GHA      | GHA      | Dec                       | GHA      | Dec      | GHA                       | Dec      | GHA      | Dec                        | GHA     | Dec | GHA                       | Dec    |  |  |
| 0               | 326°22.6 | 136°59.8 | S05°53.8                  | 231°35.8 | N23°41.7 | 193°04.7                  | N18°02.1 | 312°10.3 | N03°15.3                   |         |     |                           |        |  |  |
| 1               | 341°25.1 | 152°00.2 | 55.0                      | 246°36.5 | 41.6     | 208°06.6                  | 02.0     | 327°12.9 | 15.2                       |         |     |                           |        |  |  |
| 2               | 356°27.5 | 167°00.6 | 56.1                      | 261°37.2 | 41.6     | 223°08.5                  | 01.8     | 342°15.4 | 15.2                       |         |     |                           |        |  |  |
| 3               | 11°30.0  | 182°01.0 | 57.3                      | 276°37.9 | 41.6     | 238°10.5                  | 01.7     | 357°17.9 | 15.1                       |         |     |                           |        |  |  |
| 4               | 26°32.4  | 197°01.4 | 58.5                      | 291°38.6 | 41.6     | 253°12.4                  | 01.5     | 12°20.5  | 15.1                       |         |     |                           |        |  |  |
| 5               | 41°34.9  | 212°01.8 | 05°59.7                   | 306°39.2 | 41.6     | 268°14.3                  | 01.4     | 27°23.0  | 15.0                       |         |     |                           |        |  |  |
| 6               | 56°37.4  | 227°02.2 | S06°00.8                  | 321°39.9 | N23°41.5 | 283°16.2                  | N18°01.2 | 42°25.6  | N03°15.0                   |         |     |                           |        |  |  |
| 7               | 71°39.8  | 242°02.6 | 02.0                      | 336°40.6 | 41.5     | 298°18.1                  | 01.1     | 57°28.1  | 14.9                       |         |     |                           |        |  |  |
| 8               | 86°42.3  | 257°03.1 | 03.2                      | 351°41.3 | 41.5     | 313°20.0                  | 00.9     | 72°30.7  | 14.9                       |         |     |                           |        |  |  |
| 9               | 101°44.8 | 272°03.5 | 04.4                      | 6°42.0   | 41.5     | 328°21.9                  | 00.8     | 87°33.2  | 14.9                       |         |     |                           |        |  |  |
| 10              | 116°47.2 | 287°03.9 | 05.5                      | 21°42.6  | 41.5     | 343°23.8                  | 00.7     | 102°35.8 | 14.8                       |         |     |                           |        |  |  |
| 11              | 131°49.7 | 302°04.3 | 06.7                      | 36°43.3  | 41.4     | 358°25.8                  | 00.5     | 117°38.3 | 14.8                       |         |     |                           |        |  |  |
| 12              | 146°52.2 | 317°04.7 | S06°07.9                  | 51°44.0  | N23°41.4 | 13°27.7                   | N18°00.4 | 132°40.9 | N03°14.7                   |         |     |                           |        |  |  |
| 13              | 161°54.6 | 332°05.1 | 09.1                      | 66°44.7  | 41.4     | 28°29.6                   | 00.2     | 147°43.4 | 14.7                       |         |     |                           |        |  |  |
| 14              | 176°57.1 | 347°05.5 | 10.2                      | 81°45.4  | 41.4     | 43°31.5                   | 18°00.1  | 162°45.9 | 14.6                       |         |     |                           |        |  |  |
| 15              | 191°59.6 | 2°06.0   | 11.4                      | 96°46.0  | 41.4     | 58°33.4                   | 17°59.9  | 177°48.5 | 14.6                       |         |     |                           |        |  |  |
| 16              | 207°02.0 | 17°06.4  | 12.6                      | 111°46.7 | 41.3     | 73°35.3                   | 59.8     | 192°51.0 | 14.5                       |         |     |                           |        |  |  |
| 17              | 222°04.5 | 32°06.8  | 13.8                      | 126°47.4 | 41.3     | 88°37.2                   | 59.6     | 207°53.6 | 14.5                       |         |     |                           |        |  |  |
| 18              | 237°06.9 | 47°07.2  | S06°14.9                  | 141°48.1 | N23°41.3 | 103°39.2                  | N17°59.5 | 222°56.1 | N03°14.4                   |         |     |                           |        |  |  |
| 19              | 252°09.4 | 62°07.6  | 16.1                      | 156°48.8 | 41.3     | 118°41.1                  | 59.4     | 237°58.7 | 14.4                       |         |     |                           |        |  |  |
| 20              | 267°11.9 | 77°08.0  | 17.3                      | 171°49.4 | 41.2     | 133°43.0                  | 59.2     | 253°01.2 | 14.4                       |         |     |                           |        |  |  |
| 21              | 282°14.3 | 92°08.5  | 18.4                      | 186°50.1 | 41.2     | 148°44.9                  | 59.1     | 268°03.8 | 14.3                       |         |     |                           |        |  |  |
| 22              | 297°16.8 | 107°08.9 | 19.6                      | 201°50.8 | 41.2     | 163°46.8                  | 58.9     | 283°06.3 | 14.3                       |         |     |                           |        |  |  |
| 23              | 312°19.3 | 122°09.3 | 20.8                      | 216°51.5 | 41.2     | 178°48.7                  | 58.8     | 298°08.9 | 14.2                       |         |     |                           |        |  |  |
| Mer.pass. 02:14 |          |          | $\nu$ 0.4' d 1.2' m -4.45 |          |          | $\nu$ 0.7' d -0.0' m 1.28 |          |          | $\nu$ 1.9' d -0.1' m -1.79 |         |     | $\nu$ 2.5' d -0.0' m 0.55 |        |  |  |

| Wed             | GHA      | GHA      | Dec                       | GHA      | Dec      | GHA                       | Dec      | GHA      | Dec                        |  |  |                           |  |  |
|-----------------|----------|----------|---------------------------|----------|----------|---------------------------|----------|----------|----------------------------|--|--|---------------------------|--|--|
| 0               | 327°21.7 | 137°09.7 | S06°22.0                  | 231°52.2 | N23°41.1 | 193°50.6                  | N17°58.6 | 313°11.4 | N03°14.2                   |  |  |                           |  |  |
| 1               | 342°24.2 | 152°10.2 | 23.1                      | 246°52.9 | 41.1     | 208°52.5                  | 58.5     | 328°14.0 | 14.1                       |  |  |                           |  |  |
| 2               | 357°26.7 | 167°10.6 | 24.3                      | 261°53.5 | 41.1     | 223°54.5                  | 58.3     | 343°16.5 | 14.1                       |  |  |                           |  |  |
| 3               | 12°29.1  | 182°11.0 | 25.5                      | 276°54.2 | 41.0     | 238°56.4                  | 58.2     | 358°19.1 | 14.0                       |  |  |                           |  |  |
| 4               | 27°31.6  | 197°11.4 | 26.6                      | 291°54.9 | 41.0     | 253°58.3                  | 58.1     | 13°21.6  | 14.0                       |  |  |                           |  |  |
| 5               | 42°34.0  | 212°11.9 | 27.8                      | 306°55.6 | 41.0     | 269°00.2                  | 57.9     | 28°24.2  | 13.9                       |  |  |                           |  |  |
| 6               | 57°36.5  | 227°12.3 | S06°29.0                  | 321°56.3 | N23°41.0 | 284°02.1                  | N17°57.8 | 43°26.7  | N03°13.9                   |  |  |                           |  |  |
| 7               | 72°39.0  | 242°12.7 | 30.2                      | 336°57.0 | 40.9     | 299°04.0                  | 57.6     | 58°29.3  | 13.8                       |  |  |                           |  |  |
| 8               | 87°41.4  | 257°13.1 | 31.3                      | 351°57.6 | 40.9     | 314°05.9                  | 57.5     | 73°31.8  | 13.8                       |  |  |                           |  |  |
| 9               | 102°43.9 | 272°13.6 | 32.5                      | 6°58.3   | 40.9     | 329°07.9                  | 57.3     | 88°34.4  | 13.8                       |  |  |                           |  |  |
| 10              | 117°46.4 | 287°14.0 | 33.7                      | 21°59.0  | 40.8     | 344°09.8                  | 57.2     | 103°36.9 | 13.7                       |  |  |                           |  |  |
| 11              | 132°48.8 | 302°14.4 | 34.8                      | 36°59.7  | 40.8     | 359°11.7                  | 57.0     | 118°39.5 | 13.7                       |  |  |                           |  |  |
| 12              | 147°51.3 | 317°14.9 | S06°36.0                  | 52°00.4  | N23°40.8 | 14°13.6                   | N17°56.9 | 133°42.0 | N03°13.6                   |  |  |                           |  |  |
| 13              | 162°53.8 | 332°15.3 | 37.2                      | 67°01.1  | 40.8     | 29°15.5                   | 56.7     | 148°44.6 | 13.6                       |  |  |                           |  |  |
| 14              | 177°56.2 | 347°15.7 | 38.3                      | 82°01.7  | 40.7     | 44°17.4                   | 56.6     | 163°47.1 | 13.5                       |  |  |                           |  |  |
| 15              | 192°58.7 | 2°16.2   | 39.5                      | 97°02.4  | 40.7     | 59°19.4                   | 56.5     | 178°49.7 | 13.5                       |  |  |                           |  |  |
| 16              | 208°01.2 | 17°16.6  | 40.7                      | 112°03.1 | 40.7     | 74°21.3                   | 56.3     | 193°52.2 | 13.4                       |  |  |                           |  |  |
| 17              | 223°03.6 | 32°17.0  | 41.8                      | 127°03.8 | 40.6     | 89°23.2                   | 56.2     | 208°54.8 | 13.4                       |  |  |                           |  |  |
| 18              | 238°06.1 | 47°17.5  | S06°43.0                  | 142°04.5 | N23°40.6 | 104°25.1                  | N17°56.0 | 223°57.3 | N03°13.3                   |  |  |                           |  |  |
| 19              | 253°08.5 | 62°17.9  | 44.2                      | 157°05.2 | 40.6     | 119°27.0                  | 55.9     | 238°59.9 | 13.3                       |  |  |                           |  |  |
| 20              | 268°11.0 | 77°18.3  | 45.3                      | 172°05.9 | 40.5     | 134°28.9                  | 55.7     | 254°02.4 | 13.2                       |  |  |                           |  |  |
| 21              | 283°13.5 | 92°18.8  | 46.5                      | 187°06.5 | 40.5     | 149°30.8                  | 55.6     | 269°05.0 | 13.2                       |  |  |                           |  |  |
| 22              | 298°15.9 | 107°19.2 | 47.7                      | 202°07.2 | 40.5     | 164°32.8                  | 55.4     | 284°07.5 | 13.1                       |  |  |                           |  |  |
| 23              | 313°18.4 | 122°19.6 | 48.8                      | 217°07.9 | 40.4     | 179°34.7                  | 55.3     | 299°10.1 | 13.1                       |  |  |                           |  |  |
| Mer.pass. 02:10 |          |          | $\nu$ 0.4' d 1.2' m -4.46 |          |          | $\nu$ 0.7' d -0.0' m 1.28 |          |          | $\nu$ 1.9' d -0.1' m -1.79 |  |  | $\nu$ 2.5' d -0.0' m 0.54 |  |  |

| Thu                                                                                                                      | GHA      | GHA      | Dec      | GHA      | Dec      | GHA      | Dec      | GHA      | Dec      |
|--------------------------------------------------------------------------------------------------------------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 0                                                                                                                        | 328°20.9 | 137°20.1 | S06°50.0 | 232°08.6 | N23°40.4 | 194°36.6 | N17°55.2 | 314°12.6 | N03°13.0 |
| 1                                                                                                                        | 343°23.3 | 152°20.5 | 51.2     | 247°09.3 | 40.4     | 209°38.5 | 55.0     | 329°15.2 | 13.0     |
| 2                                                                                                                        | 358°25.8 | 167°21.0 | 52.3     | 262°10.0 | 40.3     | 224°40.4 | 54.9     | 344°17.7 | 13.0     |
| 3                                                                                                                        | 13°28.3  | 182°21.4 | 53.5     | 277°10.7 | 40.3     | 239°42.3 | 54.7     | 359°20.3 | 12.9     |
| 4                                                                                                                        | 28°30.2  | 197°21.8 | 54.6     | 292°11.4 | 40.3     | 254°44.2 | 54.6     | 14°22.8  | 12.9     |
| 5                                                                                                                        | 43°33.2  | 212°22.3 | 55.8     | 307°12.0 | 40.2     | 269°46.2 | 54.4     | 29°25.4  | 12.8     |
| 6                                                                                                                        | 58°35.7  | 227°22.7 | S06°57.0 | 322°12.7 | N23°40.2 | 284°48.1 | N17°54.3 | 44°27.9  | N03°12.8 |
| 7                                                                                                                        | 73°38.1  | 242°23.2 | 58.1     | 337°13.4 | 40.2     | 299°50.0 | 54.1     | 59°30.5  | 12.7     |
| 8                                                                                                                        | 88°40.6  | 257°23.6 | 06°59.3  | 352°14.1 | 40.1     | 314°51.9 | 54.0     | 74°33.1  | 12.7     |
| 9                                                                                                                        | 103°43.0 | 272°24.1 | 07°00.5  | 7°14.8   | 40.1     | 329°53.8 | 53.9     | 89°35.6  | 12.6     |
| 10                                                                                                                       | 118°45.5 | 287°24.5 | 01.6     | 22°15.5  | 40.0     | 344°55.7 | 53.7     | 104°38.2 | 12.6     |
| 11                                                                                                                       | 133°48.0 | 302°25.0 | 02.8     | 37°16.2  | 40.0     | 359°57.7 | 53.6     | 119°40.7 | 12.5     |
| 12                                                                                                                       | 148°50.4 | 317°25.4 | S07°03.9 | 52°16.9  | N23°40.0 | 14°59.6  | N17°53.4 | 134°43.3 | N03°12.5 |
| 13                                                                                                                       | 163°52.9 | 332°25.9 | 05.1     | 67°17.5  | 39.9     | 30°01.5  | 53.3     | 149°45.8 | 12.4     |
| 14                                                                                                                       | 178°55.4 | 347°26.3 | 06.3     | 82°18.2  | 39.9     | 45°03.4  | 53.1     | 164°48.4 | 12.4     |
| 15                                                                                                                       | 193°57.8 | 2°26.8   | 07.4     | 97°18.9  | 39.9     | 60°05.3  | 53.0     | 179°50.9 | 12.3     |
| 16                                                                                                                       | 209°00.3 | 17°27.2  | 08.6     | 112°19.6 | 39.8     | 75°07.2  | 52.8     | 194°53.5 | 12.3     |
| 17                                                                                                                       | 224°02.8 | 32°27.7  | 09.7     | 127°20.3 | 39.8     | 90°09.2  | 52.7     | 209°56.0 | 12.2     |
| 18                                                                                                                       | 239°05.2 | 47°28.1  | S07°10.9 | 142°21.0 | N23°39.7 | 105°11.1 | N17°52.5 | 224°58.6 | N03°12.2 |
| 19                                                                                                                       | 254°07.7 | 62°28.6  | 12.0     | 157°21.7 | 39.7     | 120°13.0 | 52.4     | 240°01.1 | 12.1     |
| 20                                                                                                                       | 269°10.1 | 77°29.0  | 13.2     | 172°22.4 | 39.7     | 135°14.9 | 52.3     | 255°03.7 | 12.1     |
| 21                                                                                                                       | 284°12.6 | 92°29.5  | 14.4     | 187°23.1 | 39.6     | 150°16.8 | 52.1     | 270°06.3 | 12.0     |
| 22                                                                                                                       | 299°15.1 | 107°29.9 | 15.5     | 202°23.8 | 39.6     | 165°18.7 | 52.0     | 285°08.8 | 12.0     |
| 23                                                                                                                       | 314°17.5 | 122°30.4 | 16.7     | 217°24.4 | 39.5     | 180°20.7 | 51.8     | 300°11.4 | 11.9     |
| Mer.pass. 02:06 $\nu$ 0.4' d 1.2' m -4.47 $\nu$ 0.7' d -0.0' m 1.27 $\nu$ 1.9' d -0.1' m -1.79 $\nu$ 2.6' d -0.0' m 0.54 |          |          |          |          |          |          |          |          |          |

DUT1 = UT1-UTC = +0.0142 sec ΔT = TT-UT1 = +69.1698 sec

2026 August 18 to Aug. 20 UT

| Stars               |          |          |
|---------------------|----------|----------|
|                     | SHA      | Dec      |
| Alpheratz           | 357°33.1 | 29°14.3  |
| Ankaa               | 353°05.5 | -42°09.4 |
| Schedar             | 349°29.1 | 56°40.9  |
| Diphda              | 348°45.7 | -17°50.2 |
| Achernar            | 335°18.9 | -57°05.7 |
| Hamal               | 327°49.5 | 23°35.3  |
| Polaris             | 313°16.5 | 89°22.3  |
| Acamar              | 315°10.7 | -40°11.5 |
| Menkar              | 314°04.7 | 4°11.8   |
| Mirfak              | 308°26.3 | 49°57.2  |
| Aldebaran           | 290°38.2 | 16°33.8  |
| Rigel               | 281°02.7 | -8°10.1  |
| Capella             | 280°20.1 | 46°01.3  |
| Bellatrix           | 278°21.6 | 6°22.5   |
| Elnath              | 278°00.3 | 28°37.7  |
| Anilam              | 275°36.5 | -1°11.0  |
| Betelgeuse          | 270°50.8 | 7°24.8   |
| Canopus             | 263°52.2 | -52°42.3 |
| Sirius              | 258°25.3 | -16°45.0 |
| Adhara              | 255°05.1 | -29°00.3 |
| Procyon             | 244°49.7 | 5°09.5   |
| Pollux              | 242°16.0 | 27°57.7  |
| Avior               | 234°14.8 | -59°35.5 |
| Suhail              | 222°45.8 | -43°32.3 |
| Miaplacidus         | 221°38.9 | -69°49.5 |
| Alphard             | 217°46.8 | -8°46.4  |
| Regulus             | 207°33.3 | 11°50.3  |
| Dubhe               | 193°40.0 | 61°36.5  |
| Denebola            | 182°23.9 | 14°25.5  |
| Gienah              | 175°42.5 | -17°41.4 |
| Acrux               | 172°59.1 | -63°15.0 |
| Gacrux              | 171°50.6 | -57°15.9 |
| Alioth              | 166°12.2 | 55°49.1  |
| Spica               | 158°21.1 | -11°18.0 |
| Alkaid              | 152°51.2 | 49°11.0  |
| Hadar               | 148°34.3 | -60°30.3 |
| Menkent             | 147°56.2 | -36°30.2 |
| Arcturus            | 145°46.8 | 19°02.8  |
| Rigel Kent.         | 137°30.8 | -60°57.0 |
| Kochab              | 137°20.1 | 74°03.0  |
| Zuben'ubi           | 136°54.6 | -16°09.2 |
| Alphecca            | 126°02.6 | 26°37.7  |
| Antares             | 112°14.1 | -26°29.5 |
| Atria               | 107°06.9 | -69°04.7 |
| Sabik               | 102°01.1 | -15°45.4 |
| Shaula              | 96°08.3  | -37°07.4 |
| Rasalhague          | 95°57.1  | 12°32.6  |
| Eltanin             | 90°41.3  | 51°29.3  |
| Kaus Aust.          | 83°30.5  | -34°22.3 |
| Vega                | 80°32.0  | 38°48.7  |
| Nunki               | 75°45.8  | -26°15.8 |
| Altair              | 61°58.4  | 8°56.5   |
| Peacock             | 53°03.1  | -56°38.9 |
| Deneb               | 49°24.4  | 45°27.7  |
| Enif                | 33°37.2  | 10°00.0  |
| Al Na'ir            | 27°30.8  | -46°49.8 |
| Fomalhaut           | 15°12.7  | -29°28.7 |
| Scheat              | 13°43.6  | 28°13.7  |
| Markab              | 13°28.3  | 15°21.0  |
| Aug 18 Tue          |          |          |
| Venus               | 170°37.2 | 14.52    |
| Mars                | 265°13.3 | 08.33    |
| Jupiter             | 226°42.1 | 11.06    |
| Saturn              | 345°47.7 | 03.11    |
| Aug 19 Wed          |          |          |
| Venus               | 169°48.0 | 14.51    |
| Mars                | 264°30.4 | 08.32    |
| Jupiter             | 226°28.9 | 11.03    |
| Saturn              | 345°49.7 | 03.07    |
| Aug 20 Thu          |          |          |
| Venus               | 168°59.2 | 14.50    |
| Mars                | 263°47.7 | 08.31    |
| Jupiter             | 226°15.7 | 11.00    |
| Saturn              | 345°51.8 | 03.03    |
| Horizontal parallax |          |          |
| Venus:              |          | 0.2      |
| Mars:               |          | 0.1      |



| Aries           |          |          |          | Venus                     |          |          |          | Mars                      |          |     |     | Jupiter                    |     |     |     | Saturn                    |     |     |     |
|-----------------|----------|----------|----------|---------------------------|----------|----------|----------|---------------------------|----------|-----|-----|----------------------------|-----|-----|-----|---------------------------|-----|-----|-----|
| Fri             | GHA      | GHA      | Dec      | GHA                       | Dec      | GHA      | Dec      | GHA                       | Dec      | GHA | Dec | GHA                        | Dec | GHA | Dec | GHA                       | Dec | GHA | Dec |
| 0               | 329°20.0 | 137°30.8 | S07°17.8 | 232°25.1                  | N23°39.5 | 195°22.6 | N17°51.7 | 315°13.9                  | N03°11.9 |     |     |                            |     |     |     |                           |     |     |     |
| 1               | 344°22.5 | 152°31.3 | 19.0     | 247°25.8                  | 39.5     | 210°24.5 | 51.5     | 330°16.5                  | 11.8     |     |     |                            |     |     |     |                           |     |     |     |
| 2               | 359°24.9 | 167°31.8 | 20.1     | 262°25.8                  | 39.4     | 225°26.4 | 51.4     | 345°19.0                  | 11.8     |     |     |                            |     |     |     |                           |     |     |     |
| 3               | 14°27.4  | 182°32.2 | .. 21.3  | 277°27.2                  | .. 39.4  | 240°28.3 | .. 51.2  | 0°21.6                    | .. 11.7  |     |     |                            |     |     |     |                           |     |     |     |
| 4               | 29°29.9  | 197°32.7 | 22.5     | 292°27.9                  | 39.3     | 255°30.2 | 51.1     | 15°24.1                   | 11.7     |     |     |                            |     |     |     |                           |     |     |     |
| 5               | 44°32.3  | 212°33.1 | 23.6     | 307°28.6                  | 39.3     | 270°32.2 | 51.0     | 30°26.7                   | 11.7     |     |     |                            |     |     |     |                           |     |     |     |
| 6               | 59°34.8  | 227°33.6 | S07°24.8 | 322°29.3                  | N23°39.0 | 285°34.1 | N17°50.8 | 45°29.3                   | N03°11.6 |     |     |                            |     |     |     |                           |     |     |     |
| 7               | 74°37.3  | 242°34.1 | 25.9     | 337°30.0                  | 39.2     | 300°36.0 | 50.7     | 60°31.8                   | 11.6     |     |     |                            |     |     |     |                           |     |     |     |
| 8               | 89°39.7  | 257°34.5 | 27.1     | 352°30.7                  | 39.2     | 315°37.9 | 50.5     | 75°34.4                   | 11.5     |     |     |                            |     |     |     |                           |     |     |     |
| 9               | 104°42.2 | 272°35.0 | .. 28.2  | 7°31.4                    | .. 39.1  | 330°39.8 | .. 50.4  | 90°36.9                   | .. 11.5  |     |     |                            |     |     |     |                           |     |     |     |
| 10              | 119°44.6 | 287°35.5 | 29.4     | 22°32.1                   | 39.1     | 345°41.7 | 50.2     | 105°39.5                  | 11.4     |     |     |                            |     |     |     |                           |     |     |     |
| 11              | 134°47.1 | 302°35.9 | 30.5     | 37°32.7                   | 39.0     | 0°43.7   | 50.1     | 120°42.0                  | 11.4     |     |     |                            |     |     |     |                           |     |     |     |
| 12              | 149°49.6 | 317°36.4 | S07°31.7 | 52°33.4                   | N23°39.0 | 15°45.6  | N17°49.9 | 135°44.6                  | N03°11.3 |     |     |                            |     |     |     |                           |     |     |     |
| 13              | 164°52.0 | 332°36.9 | 32.8     | 67°34.1                   | 38.9     | 30°47.5  | 49.8     | 150°47.2                  | 11.3     |     |     |                            |     |     |     |                           |     |     |     |
| 14              | 179°54.5 | 347°37.3 | 34.0     | 82°34.8                   | 38.9     | 45°49.4  | 49.6     | 165°49.7                  | 11.2     |     |     |                            |     |     |     |                           |     |     |     |
| 15              | 194°57.0 | 2°37.8   | .. 35.1  | 97°35.5                   | .. 38.8  | 60°51.3  | .. 49.5  | 180°52.3                  | .. 11.2  |     |     |                            |     |     |     |                           |     |     |     |
| 16              | 209°59.4 | 17°38.3  | 36.3     | 112°36.2                  | 38.8     | 75°53.2  | 49.4     | 195°54.8                  | 11.1     |     |     |                            |     |     |     |                           |     |     |     |
| 17              | 225°01.9 | 32°38.7  | 37.4     | 127°36.9                  | 38.7     | 90°55.2  | 49.2     | 210°57.4                  | 11.1     |     |     |                            |     |     |     |                           |     |     |     |
| 18              | 240°04.4 | 47°39.2  | S07°38.6 | 142°37.6                  | N23°38.7 | 105°57.1 | N17°49.1 | 225°59.9                  | N03°11.0 |     |     |                            |     |     |     |                           |     |     |     |
| 19              | 255°06.8 | 62°39.7  | 39.7     | 157°38.3                  | 38.6     | 120°59.0 | 48.9     | 241°02.5                  | 11.0     |     |     |                            |     |     |     |                           |     |     |     |
| 20              | 270°09.3 | 77°40.1  | 40.9     | 172°39.0                  | 38.6     | 136°00.9 | 48.8     | 256°05.1                  | 10.9     |     |     |                            |     |     |     |                           |     |     |     |
| 21              | 285°11.8 | 92°40.6  | .. 42.0  | 187°39.7                  | .. 38.6  | 151°02.8 | .. 48.6  | 271°07.6                  | .. 10.9  |     |     |                            |     |     |     |                           |     |     |     |
| 22              | 300°14.2 | 107°41.1 | 43.2     | 202°40.4                  | 38.5     | 166°04.8 | 48.5     | 286°10.2                  | 10.8     |     |     |                            |     |     |     |                           |     |     |     |
| 23              | 315°16.7 | 122°41.6 | 44.3     | 217°41.1                  | 38.5     | 181°06.7 | 48.3     | 301°12.7                  | 10.8     |     |     |                            |     |     |     |                           |     |     |     |
| Mer.pass. 02:02 |          |          |          | $\nu$ 0.5' d 1.2' m -4.49 |          |          |          | $\nu$ 0.7' d -0.0' m 1.27 |          |     |     | $\nu$ 1.9' d -0.1' m -1.79 |     |     |     | $\nu$ 2.6' d -0.0' m 0.53 |     |     |     |

| Sat                                                                                                                      | GHA      | GHA      | Dec      | GHA      | Dec      | GHA      | Dec      | GHA      | Dec      |
|--------------------------------------------------------------------------------------------------------------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 0                                                                                                                        | 330°19.1 | 137°42.0 | S07°45.5 | 232°41.8 | N23°38.4 | 196°08.6 | N17°48.2 | 316°15.3 | N03°10.7 |
| 1                                                                                                                        | 345°21.6 | 152°42.5 | 46.6     | 247°42.5 | 38.4     | 211°10.5 | 48.0     | 331°17.9 | 10.7     |
| 2                                                                                                                        | 0°24.1   | 167°43.0 | 47.8     | 262°43.2 | 38.3     | 226°12.4 | 47.9     | 346°20.4 | 10.6     |
| 3                                                                                                                        | 15°26.5  | 182°43.5 | .. 48.9  | 277°43.9 | .. 38.3  | 241°14.3 | .. 47.8  | 1°23.0   | .. 10.6  |
| 4                                                                                                                        | 30°29.0  | 197°44.0 | 50.1     | 292°44.6 | 38.2     | 256°16.3 | 47.6     | 16°25.5  | 10.5     |
| 5                                                                                                                        | 45°31.5  | 212°44.4 | 51.2     | 307°45.2 | 38.2     | 271°18.2 | 47.5     | 31°28.1  | 10.5     |
| 6                                                                                                                        | 60°33.9  | 227°44.9 | S07°52.4 | 322°45.9 | N23°38.1 | 286°20.1 | N17°47.3 | 46°30.7  | N03°10.4 |
| 7                                                                                                                        | 75°36.4  | 242°45.4 | 53.5     | 337°46.6 | 38.1     | 301°22.0 | 47.2     | 61°33.2  | 10.4     |
| 8                                                                                                                        | 90°38.9  | 257°45.9 | 54.7     | 352°47.3 | 38.0     | 316°23.9 | 47.0     | 76°35.8  | 10.3     |
| 9                                                                                                                        | 105°41.3 | 272°46.4 | .. 55.8  | 7°48.0   | .. 37.9  | 331°25.9 | .. 46.9  | 91°38.3  | .. 10.3  |
| 10                                                                                                                       | 120°43.8 | 287°46.8 | 57.0     | 22°48.7  | 37.9     | 346°27.8 | 46.7     | 106°40.9 | 10.2     |
| 11                                                                                                                       | 135°46.3 | 302°47.3 | 58.1     | 37°49.4  | 37.8     | 1°29.7   | 46.6     | 121°43.5 | 10.2     |
| 12                                                                                                                       | 150°48.7 | 317°47.8 | S07°59.2 | 52°50.1  | N23°37.8 | 16°31.6  | N17°46.4 | 136°46.0 | N03°10.1 |
| 13                                                                                                                       | 165°51.2 | 332°48.3 | 08°00.4  | 67°50.8  | 37.7     | 31°33.5  | 46.3     | 151°48.6 | 10.1     |
| 14                                                                                                                       | 180°53.6 | 347°48.8 | 01.5     | 82°51.5  | 37.6     | 46°35.5  | 46.2     | 166°51.1 | 10.0     |
| 15                                                                                                                       | 195°56.1 | 2°49.3   | .. 02.7  | 97°52.2  | .. 37.6  | 61°37.4  | .. 46.0  | 181°53.7 | .. 10.0  |
| 16                                                                                                                       | 210°58.6 | 17°49.8  | 03.8     | 112°52.9 | 37.6     | 76°39.3  | 45.9     | 196°56.3 | 09.9     |
| 17                                                                                                                       | 226°01.0 | 32°50.2  | 05.0     | 127°53.6 | 37.5     | 91°41.2  | 45.7     | 211°58.8 | 09.9     |
| 18                                                                                                                       | 241°03.5 | 47°50.7  | S08°06.1 | 142°54.3 | N23°37.5 | 106°43.1 | N17°45.6 | 227°01.4 | N03°09.8 |
| 19                                                                                                                       | 256°06.0 | 62°51.2  | 07.2     | 157°55.0 | 37.4     | 121°45.1 | 45.4     | 242°03.9 | 09.7     |
| 20                                                                                                                       | 271°08.4 | 77°51.7  | 08.4     | 172°55.7 | 37.4     | 136°47.0 | 45.3     | 257°06.5 | 09.7     |
| 21                                                                                                                       | 286°10.9 | 92°52.2  | .. 09.5  | 187°56.4 | .. 37.3  | 151°48.9 | .. 45.1  | 272°09.1 | .. 09.6  |
| 22                                                                                                                       | 301°13.4 | 107°52.7 | 10.7     | 202°57.1 | 37.2     | 166°50.8 | 45.0     | 287°11.6 | 09.6     |
| 23                                                                                                                       | 316°15.8 | 122°53.2 | 11.8     | 217°57.8 | 37.2     | 181°52.7 | 44.8     | 302°14.2 | 09.5     |
| Mer.pass. 01:58 $\nu$ 0.5' d 1.1' m -4.50 $\nu$ 0.7' d -0.0' m 1.27 $\nu$ 1.9' d -0.1' m -1.79 $\nu$ 2.6' d -0.1' m 0.53 |          |          |          |          |          |          |          |          |          |

| Sun                                                                                                                      | GHA      | GHA      | Dec      | GHA      | Dec      | GHA      | Dec      | GHA      | Dec      |
|--------------------------------------------------------------------------------------------------------------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 0                                                                                                                        | 331°18.3 | 137°53.7 | S08°12.9 | 232°58.5 | N23°37.1 | 196°54.7 | N17°44.7 | 317°16.8 | N03°09.5 |
| 1                                                                                                                        | 346°20.7 | 152°54.2 | 14.1     | 247°59.2 | 37.1     | 211°56.6 | 44.6     | 332°19.3 | 09.4     |
| 2                                                                                                                        | 1°23.2   | 167°54.7 | 15.2     | 262°59.9 | 37.0     | 226°58.5 | 44.4     | 347°21.9 | 09.4     |
| 3                                                                                                                        | 16°25.7  | 182°55.2 | .. 16.4  | 278°00.6 | .. 37.0  | 242°00.4 | .. 44.3  | 2°24.4   | .. 09.3  |
| 4                                                                                                                        | 31°28.1  | 197°55.7 | 17.5     | 293°01.3 | 36.9     | 257°02.3 | 44.1     | 17°27.0  | 09.3     |
| 5                                                                                                                        | 46°30.6  | 212°56.2 | 18.6     | 308°02.0 | 36.8     | 272°04.3 | 44.0     | 32°29.6  | 09.2     |
| 6                                                                                                                        | 61°33.1  | 227°56.7 | S08°19.8 | 323°02.7 | N23°36.8 | 287°06.2 | N17°43.8 | 47°32.1  | N03°09.2 |
| 7                                                                                                                        | 76°35.5  | 242°57.2 | 20.9     | 338°03.4 | 36.7     | 302°08.1 | 43.7     | 62°34.7  | 09.1     |
| 8                                                                                                                        | 91°38.0  | 257°57.7 | 22.0     | 353°04.1 | 36.7     | 317°10.0 | 43.5     | 77°37.3  | 09.1     |
| 9                                                                                                                        | 106°40.5 | 272°58.2 | .. 23.2  | 8°04.8   | .. 36.6  | 332°11.9 | .. 43.4  | 92°39.8  | .. 09.0  |
| 10                                                                                                                       | 121°42.9 | 287°58.7 | 24.3     | 23°05.5  | 36.5     | 347°13.9 | 43.2     | 107°42.4 | 09.0     |
| 11                                                                                                                       | 136°45.4 | 302°59.2 | 25.4     | 38°06.2  | 36.5     | 2°15.8   | 43.1     | 122°44.9 | 08.9     |
| 12                                                                                                                       | 151°47.9 | 317°59.7 | S08°26.6 | 53°06.9  | N23°36.4 | 17°17.7  | N17°43.0 | 137°47.5 | N03°08.9 |
| 13                                                                                                                       | 166°50.3 | 333°00.2 | 27.7     | 68°07.6  | 36.4     | 32°19.6  | 42.8     | 152°50.1 | 08.8     |
| 14                                                                                                                       | 181°52.8 | 348°00.7 | 28.9     | 83°08.3  | 36.3     | 47°21.5  | 42.7     | 167°52.6 | 08.8     |
| 15                                                                                                                       | 196°55.2 | 3°01.2   | .. 30.0  | 98°09.0  | .. 36.2  | 62°23.5  | .. 42.5  | 182°55.2 | .. 08.7  |
| 16                                                                                                                       | 211°57.7 | 18°01.7  | 31.1     | 113°09.7 | 36.2     | 77°25.4  | 42.4     | 197°57.8 | 08.7     |
| 17                                                                                                                       | 227°00.2 | 33°02.2  | 32.3     | 128°10.4 | 36.1     | 92°27.3  | 42.2     | 213°00.3 | 08.6     |
| 18                                                                                                                       | 242°02.6 | 48°02.7  | S08°33.4 | 143°11.1 | N23°36.1 | 107°29.2 | N17°42.1 | 228°02.9 | N03°08.6 |
| 19                                                                                                                       | 257°05.1 | 63°03.2  | 34.5     | 158°11.8 | 36.0     | 122°31.1 | 41.9     | 243°05.5 | 08.5     |
| 20                                                                                                                       | 272°07.6 | 78°03.7  | 35.7     | 173°12.5 | 35.9     | 137°33.1 | 41.8     | 258°08.0 | 08.5     |
| 21                                                                                                                       | 287°10.0 | 93°04.2  | .. 36.8  | 188°13.2 | .. 35.9  | 152°35.0 | .. 41.6  | 273°10.6 | .. 08.4  |
| 22                                                                                                                       | 302°12.5 | 108°04.7 | 37.9     | 203°13.9 | 35.8     | 167°36.9 | 41.5     | 288°13.2 | 08.4     |
| 23                                                                                                                       | 317°15.0 | 123°05.3 | 39.0     | 218°14.6 | 35.7     | 182°38.8 | 41.4     | 303°15.7 | 08.3     |
| Mer.pass. 01:54 $\nu$ 0.5' d 1.1' m -4.51 $\nu$ 0.7' d -0.1' m 1.27 $\nu$ 1.9' d -0.1' m -1.79 $\nu$ 2.6' d -0.1' m 0.52 |          |          |          |          |          |          |          |          |          |

| Stars               |          |          |  |
|---------------------|----------|----------|--|
|                     | SHA      | Dec      |  |
| Alpheratz           | 357°33.1 | 29°14.3  |  |
| Ankaa               | 353°05.5 | -42°09.4 |  |
| Schedar             | 349°29.1 | 56°40.9  |  |
| Diphda              | 348°45.7 | -17°50.2 |  |
| Achernar            | 335°18.9 | -57°05.7 |  |
| Hamal               | 327°49.5 | 23°35.3  |  |
| Polaris             | 313°14.7 | 89°22.3  |  |
| Acamar              | 315°10.7 | -40°11.5 |  |
| Menkar              | 314°04.7 | 4°11.8   |  |
| Mirfak              | 308°26.3 | 49°57.2  |  |
| Aldebaran           | 290°38.1 | 16°33.8  |  |
| Rigel               | 281°02.7 | -8°10.1  |  |
| Capella             | 280°20.1 | 46°01.3  |  |
| Bellatrix           | 278°21.6 | 6°22.5   |  |
| Elath               | 278°00.3 | 28°37.7  |  |
| Alnilam             | 275°36.5 | -1°11.0  |  |
| Betelgeuse          | 270°50.8 | 7°24.8   |  |
| Canopus             | 263°52.1 | -52°42.3 |  |
| Sirius              | 258°25.3 | -16°45.0 |  |
| Adhara              | 255°05.1 | -29°00.3 |  |
| Procyon             | 244°49.7 | 5°09.5   |  |
| Pollux              | 242°16.0 | 27°57.7  |  |
| Avior               | 234°14.8 | -59°35.5 |  |
| Suhail              | 222°45.8 | -43°32.3 |  |
| Miaplacidus         | 221°38.9 | -69°49.5 |  |
| Alphard             | 217°46.8 | -8°46.4  |  |
| Regulus             | 207°33.3 | 11°50.3  |  |
| Dubhe               | 193°40.0 | 61°36.5  |  |
| Denebola            | 182°23.9 | 14°25.5  |  |
| Gienah              | 175°42.5 | -17°41.4 |  |
| Acrux               | 172°59.1 | -63°15.0 |  |
| Gacrux              | 171°50.6 | -57°15.9 |  |
| Alioth              | 166°12.2 | 55°49.1  |  |
| Spica               | 158°21.1 | -11°18.0 |  |
| Alkaid              | 152°51.2 | 49°11.0  |  |
| Hadar               | 148°34.4 | -60°30.3 |  |
| Menkent             | 147°56.2 | -36°30.2 |  |
| Arcturus            | 145°46.8 | 19°02.8  |  |
| Rigel Kent.         | 139°38.6 | -60°57.0 |  |
| Kochab              | 137°20.1 | 74°03.0  |  |
| Zuben'ubi           | 136°54.6 | -16°09.2 |  |
| Alphecca            | 126°02.6 | -26°37.7 |  |
| Antares             | 112°14.1 | -26°29.5 |  |
| Atria               | 107°06.9 | -69°04.7 |  |
| Sabik               | 102°01.1 | -15°45.4 |  |
| Shaula              | 96°08.3  | -33°07.0 |  |
| Rasalhague          | 95°08.7  | 12°39.6  |  |
| Eltanin             | 90°41.3  | 51°29.4  |  |
| Kaus Aust.          | 83°30.5  | -34°22.3 |  |
| Vega                | 80°32.0  | 38°48.7  |  |
| Nunki               | 75°54.8  | -26°15.8 |  |
| Altair              | 61°58.4  | 8°56.5   |  |
| Peacock             | 53°03.1  | -56°38.9 |  |
| Deneb               | 49°24.4  | 45°22.7  |  |
| Enif                | 33°37.1  | 10°00.0  |  |
| Al Na'ir            | 27°30.8  | -46°54.8 |  |
| Fomalhaut           | 15°12.7  | -29°28.7 |  |
| Scheat              | 13°43.5  | 28°13.7  |  |
| Markab              | 13°28.2  | 15°21.1  |  |
| Aug 21 Fri          | SHA      | Mer,pass |  |
| Venus               | 168°10.8 | 14.49    |  |
| Mars                | 263°05.1 | 08.30    |  |
| Jupiter             | 226°02.6 | 10.57    |  |
| Saturn              | 345°53.9 | 02.59    |  |
| Aug 22 Sat          | SHA      | Mer,pass |  |
| Venus               | 167°22.9 | 14.49    |  |
| Mars                | 262°22.6 | 08.30    |  |
| Jupiter             | 225°49.4 | 10.59    |  |
| Saturn              | 345°56.2 | 02.54    |  |
| Aug 23 Sun          | SHA      | Mer,pass |  |
| Venus               | 166°35.4 | 14.48    |  |
| Mars                | 261°40.2 | 08.28    |  |
| Jupiter             | 225°36.6 | 10.10    |  |
| Saturn              | 345°58.5 | 02.50    |  |
| Horizontal parallax |          |          |  |
| Venus:              |          | 0.2      |  |
| Mars:               |          | 0.1      |  |

| Aries                                                                                                                    |          |  | Venus    |          |  | Mars     |          |  | Jupiter  |          |  | Saturn   |          |  |
|--------------------------------------------------------------------------------------------------------------------------|----------|--|----------|----------|--|----------|----------|--|----------|----------|--|----------|----------|--|
| Mon                                                                                                                      | GHA      |  | GHA      | Dec      |  | GHA      | Dec      |  | GHA      | Dec      |  | GHA      | Dec      |  |
| 0                                                                                                                        | 332°17.4 |  | 138°05.8 | S08°40.2 |  | 233°15.3 | N23°35.7 |  | 197°40.8 | N17°41.2 |  | 318°18.3 | N03°08.2 |  |
| 1                                                                                                                        | 347°19.9 |  | 153°06.3 | 41.3     |  | 248°16.0 | 35.6     |  | 212°42.7 | 41.1     |  | 333°20.9 | 08.2     |  |
| 2                                                                                                                        | 2°22.4   |  | 168°06.8 | 42.4     |  | 263°16.8 | 35.5     |  | 227°44.6 | 40.9     |  | 348°23.4 | 08.1     |  |
| 3                                                                                                                        | 17°24.8  |  | 183°07.3 | .. 43.6  |  | 278°17.5 | .. 35.5  |  | 242°46.5 | .. 40.8  |  | 3°26.0   | .. 08.1  |  |
| 4                                                                                                                        | 32°27.3  |  | 198°07.3 | 44.7     |  | 293°18.2 | 35.4     |  | 257°48.4 | 40.6     |  | 18°28.6  | 08.0     |  |
| 5                                                                                                                        | 47°29.7  |  | 213°08.4 | 45.8     |  | 308°18.9 | 35.4     |  | 272°50.4 | 40.5     |  | 33°31.1  | 08.0     |  |
| 6                                                                                                                        | 62°32.2  |  | 228°08.9 | S08°47.0 |  | 323°19.6 | N23°35.3 |  | 287°52.3 | N17°40.3 |  | 48°33.7  | N03°07.9 |  |
| 7                                                                                                                        | 77°34.7  |  | 243°09.4 | 48.1     |  | 338°20.3 | 35.2     |  | 302°54.2 | 40.2     |  | 63°36.3  | 07.9     |  |
| 8                                                                                                                        | 92°37.1  |  | 258°09.9 | 49.2     |  | 353°21.0 | 35.2     |  | 317°56.1 | 40.0     |  | 78°38.8  | 07.8     |  |
| 9                                                                                                                        | 107°39.6 |  | 273°10.4 | .. 50.3  |  | 8°21.7   | .. 35.1  |  | 332°58.0 | .. 39.9  |  | 93°41.4  | .. 07.8  |  |
| 10                                                                                                                       | 122°42.1 |  | 288°11.0 | 51.5     |  | 23°22.4  | 35.0     |  | 348°00.0 | 39.8     |  | 108°44.0 | 07.7     |  |
| 11                                                                                                                       | 137°44.5 |  | 303°11.5 | 52.6     |  | 38°23.1  | 35.0     |  | 3°01.9   | 39.6     |  | 123°46.5 | 07.7     |  |
| 12                                                                                                                       | 152°47.0 |  | 318°12.0 | S08°53.7 |  | 53°23.8  | N23°34.9 |  | 18°03.8  | N17°39.5 |  | 138°49.1 | N03°07.6 |  |
| 13                                                                                                                       | 167°49.5 |  | 333°12.5 | 54.8     |  | 68°24.5  | 34.8     |  | 33°05.7  | 39.3     |  | 153°51.7 | 07.6     |  |
| 14                                                                                                                       | 182°51.9 |  | 348°13.0 | 56.0     |  | 83°25.2  | 34.7     |  | 48°07.7  | 39.2     |  | 168°54.2 | 07.5     |  |
| 15                                                                                                                       | 197°54.4 |  | 3°13.6   | .. 57.1  |  | 98°25.9  | .. 34.7  |  | 63°09.6  | .. 39.0  |  | 183°56.8 | .. 07.5  |  |
| 16                                                                                                                       | 212°56.9 |  | 18°14.1  | 58.2     |  | 113°26.6 | 34.6     |  | 78°11.5  | 38.9     |  | 198°59.4 | 07.4     |  |
| 17                                                                                                                       | 227°59.3 |  | 33°14.6  | S08°59.3 |  | 128°27.3 | 34.5     |  | 93°13.4  | 38.7     |  | 214°01.9 | 07.3     |  |
| 18                                                                                                                       | 243°01.8 |  | 48°15.2  | 08°05.5  |  | 143°28.0 | N23°34.5 |  | 108°15.3 | N17°38.6 |  | 229°04.5 | N03°07.3 |  |
| 19                                                                                                                       | 258°04.2 |  | 63°15.7  | 01.6     |  | 158°28.8 | 34.4     |  | 123°17.3 | 38.4     |  | 244°07.1 | 07.2     |  |
| 20                                                                                                                       | 273°06.7 |  | 78°16.2  | 02.7     |  | 173°29.5 | 34.3     |  | 138°19.2 | 38.3     |  | 259°09.6 | 07.2     |  |
| 21                                                                                                                       | 288°09.2 |  | 93°16.7  | .. 03.8  |  | 188°30.2 | .. 34.2  |  | 153°21.1 | .. 38.1  |  | 274°12.2 | .. 07.1  |  |
| 22                                                                                                                       | 303°11.6 |  | 108°17.3 | 04.0     |  | 203°30.9 | 34.0     |  | 168°23.0 | 38.0     |  | 289°14.8 | 07.1     |  |
| 23                                                                                                                       | 318°14.1 |  | 123°17.8 | 06.1     |  | 218°31.6 | 34.1     |  | 183°25.0 | 37.9     |  | 304°17.3 | 07.0     |  |
| Mer.pass. 01:51 $\nu$ 0.5' d 1.1' m -4.52 $\nu$ 0.7' d -0.1' m 1.26 $\nu$ 1.9' d -0.1' m -1.79 $\nu$ 2.6' d -0.1' m 0.52 |          |  |          |          |  |          |          |  |          |          |  |          |          |  |

| Tue                                                                                                                      | GHA      |  | GHA      | Dec      |  | GHA      | Dec      |  | GHA      | Dec      |  | GHA      | Dec      |  |
|--------------------------------------------------------------------------------------------------------------------------|----------|--|----------|----------|--|----------|----------|--|----------|----------|--|----------|----------|--|
| 0                                                                                                                        | 333°16.6 |  | 138°18.3 | S09°07.2 |  | 233°32.3 | N23°34.0 |  | 198°26.9 | N17°37.7 |  | 319°19.9 | N03°07.0 |  |
| 1                                                                                                                        | 348°19.0 |  | 153°18.9 | 08.3     |  | 248°33.0 | 34.0     |  | 213°28.8 | 37.6     |  | 334°22.5 | 06.9     |  |
| 2                                                                                                                        | 3°21.5   |  | 168°19.4 | 09.4     |  | 263°33.7 | 33.9     |  | 228°30.7 | 37.4     |  | 349°25.0 | 06.9     |  |
| 3                                                                                                                        | 18°24.0  |  | 183°19.9 | .. 10.5  |  | 278°34.4 | .. 33.8  |  | 243°32.7 | .. 37.3  |  | 4°27.6   | .. 06.8  |  |
| 4                                                                                                                        | 33°26.4  |  | 198°20.5 | 11.7     |  | 293°35.1 | 33.8     |  | 258°34.6 | 37.1     |  | 19°30.2  | 06.8     |  |
| 5                                                                                                                        | 48°28.9  |  | 213°21.0 | 12.8     |  | 308°35.8 | 33.7     |  | 273°36.5 | 37.0     |  | 34°32.7  | 06.7     |  |
| 6                                                                                                                        | 63°31.3  |  | 228°21.6 | S09°13.9 |  | 323°36.5 | N23°33.6 |  | 288°38.4 | N17°36.8 |  | 49°35.3  | N03°06.6 |  |
| 7                                                                                                                        | 78°33.8  |  | 243°22.1 | 15.0     |  | 338°37.3 | 33.5     |  | 303°40.4 | 36.7     |  | 64°37.9  | 06.6     |  |
| 8                                                                                                                        | 93°36.3  |  | 258°22.6 | 16.1     |  | 353°38.0 | 33.5     |  | 318°42.3 | 36.5     |  | 79°40.5  | 06.5     |  |
| 9                                                                                                                        | 108°38.7 |  | 273°23.2 | .. 17.3  |  | 8°38.7   | .. 33.4  |  | 333°44.2 | .. 36.4  |  | 94°43.0  | .. 06.5  |  |
| 10                                                                                                                       | 123°41.2 |  | 288°23.7 | 18.4     |  | 23°39.4  | 33.3     |  | 348°46.1 | 36.3     |  | 109°45.6 | 06.4     |  |
| 11                                                                                                                       | 138°43.7 |  | 303°24.3 | 19.5     |  | 38°40.1  | 33.2     |  | 3°48.0   | 36.1     |  | 124°48.2 | 06.4     |  |
| 12                                                                                                                       | 153°46.1 |  | 318°24.8 | S09°20.6 |  | 53°40.6  | N23°33.2 |  | 18°50.0  | N17°36.0 |  | 139°50.7 | N03°06.3 |  |
| 13                                                                                                                       | 168°48.6 |  | 333°25.4 | 21.7     |  | 68°41.5  | 33.1     |  | 33°51.9  | 35.8     |  | 154°53.3 | 06.3     |  |
| 14                                                                                                                       | 183°51.1 |  | 348°25.9 | 22.8     |  | 83°42.2  | 33.0     |  | 48°53.8  | 35.7     |  | 169°55.9 | 06.2     |  |
| 15                                                                                                                       | 198°53.5 |  | 3°26.4   | .. 24.0  |  | 98°42.9  | .. 32.9  |  | 63°55.7  | .. 35.5  |  | 184°58.5 | .. 06.2  |  |
| 16                                                                                                                       | 213°56.0 |  | 18°27.0  | 25.1     |  | 113°43.7 | 32.8     |  | 78°57.7  | 35.4     |  | 200°01.0 | 06.1     |  |
| 17                                                                                                                       | 228°58.5 |  | 33°27.5  | 26.2     |  | 128°44.4 | 32.9     |  | 93°59.6  | 35.2     |  | 215°03.6 | 06.0     |  |
| 18                                                                                                                       | 244°00.9 |  | 48°28.1  | S09°27.3 |  | 143°45.1 | N23°32.7 |  | 109°01.5 | N17°35.1 |  | 230°06.2 | N03°06.0 |  |
| 19                                                                                                                       | 259°03.4 |  | 63°28.6  | 28.4     |  | 158°45.8 | 32.6     |  | 124°03.4 | 34.9     |  | 245°08.7 | 05.9     |  |
| 20                                                                                                                       | 274°05.8 |  | 78°29.2  | 29.5     |  | 173°46.5 | 32.5     |  | 139°05.4 | 34.8     |  | 260°11.3 | 05.9     |  |
| 21                                                                                                                       | 289°08.3 |  | 93°29.7  | .. 30.6  |  | 188°47.2 | .. 32.5  |  | 154°07.3 | .. 34.6  |  | 275°13.9 | .. 05.8  |  |
| 22                                                                                                                       | 304°10.8 |  | 108°30.3 | 31.7     |  | 203°47.9 | 32.4     |  | 169°09.2 | 34.5     |  | 290°16.5 | 05.8     |  |
| 23                                                                                                                       | 319°13.2 |  | 123°30.8 | 32.9     |  | 218°48.6 | 32.3     |  | 184°11.1 | 34.4     |  | 305°19.0 | 05.7     |  |
| Mer.pass. 01:47 $\nu$ 0.5' d 1.1' m -4.53 $\nu$ 0.7' d -0.1' m 1.26 $\nu$ 1.9' d -0.1' m -1.80 $\nu$ 2.6' d -0.1' m 0.51 |          |  |          |          |  |          |          |  |          |          |  |          |          |  |

| Wed                                                                                                                      | GHA      |  | GHA      | Dec      |  | GHA      | Dec      |  | GHA      | Dec      |  | GHA      | Dec      |  |
|--------------------------------------------------------------------------------------------------------------------------|----------|--|----------|----------|--|----------|----------|--|----------|----------|--|----------|----------|--|
| 0                                                                                                                        | 334°15.7 |  | 138°31.4 | S09°34.0 |  | 233°49.4 | N23°32.2 |  | 199°13.1 | N17°34.2 |  | 320°21.6 | N03°05.7 |  |
| 1                                                                                                                        | 349°18.2 |  | 153°32.0 | 35.1     |  | 248°50.1 | 32.2     |  | 214°15.0 | 34.1     |  | 335°24.2 | 05.6     |  |
| 2                                                                                                                        | 4°20.6   |  | 168°32.5 | 36.2     |  | 263°50.8 | 32.1     |  | 229°16.9 | 33.9     |  | 350°26.7 | 05.6     |  |
| 3                                                                                                                        | 19°23.1  |  | 183°33.1 | .. 37.3  |  | 278°51.5 | .. 32.0  |  | 244°18.8 | .. 33.8  |  | 4°52.9   | .. 05.5  |  |
| 4                                                                                                                        | 34°25.1  |  | 198°33.6 | 38.4     |  | 293°52.2 | 31.9     |  | 259°20.8 | 33.6     |  | 20°31.9  | 05.4     |  |
| 5                                                                                                                        | 49°28.0  |  | 213°34.2 | 39.5     |  | 308°52.9 | 31.8     |  | 274°22.7 | 33.5     |  | 35°34.5  | 05.4     |  |
| 6                                                                                                                        | 64°30.5  |  | 228°34.7 | S09°40.6 |  | 323°53.6 | N23°31.8 |  | 289°24.6 | N17°33.3 |  | 50°37.0  | N03°05.3 |  |
| 7                                                                                                                        | 79°33.0  |  | 243°35.3 | 41.7     |  | 338°54.3 | 31.7     |  | 304°26.5 | 33.2     |  | 65°39.6  | 05.3     |  |
| 8                                                                                                                        | 94°35.4  |  | 258°35.9 | 42.8     |  | 353°55.1 | 31.6     |  | 319°28.5 | 33.0     |  | 80°42.2  | 05.2     |  |
| 9                                                                                                                        | 109°37.9 |  | 273°36.4 | .. 43.9  |  | 8°55.8   | .. 31.5  |  | 334°30.4 | .. 32.9  |  | 95°44.8  | .. 05.2  |  |
| 10                                                                                                                       | 124°40.3 |  | 288°37.0 | 45.0     |  | 23°56.5  | 31.4     |  | 349°32.3 | 32.7     |  | 110°47.3 | 05.1     |  |
| 11                                                                                                                       | 139°42.8 |  | 303°37.6 | 46.2     |  | 38°57.2  | 31.3     |  | 4°34.2   | 32.6     |  | 125°49.9 | 05.1     |  |
| 12                                                                                                                       | 154°45.3 |  | 318°38.1 | S09°47.3 |  | 53°57.9  | N23°31.3 |  | 19°36.2  | N17°32.5 |  | 140°52.5 | N03°05.0 |  |
| 13                                                                                                                       | 169°47.7 |  | 333°38.7 | 48.4     |  | 68°58.6  | 31.2     |  | 34°38.1  | 32.3     |  | 155°55.0 | 04.9     |  |
| 14                                                                                                                       | 184°50.2 |  | 348°39.2 | 49.5     |  | 83°59.4  | 31.1     |  | 49°40.0  | 32.2     |  | 170°57.6 | 04.9     |  |
| 15                                                                                                                       | 199°52.7 |  | 3°39.8   | .. 50.6  |  | 99°00.1  | .. 31.0  |  | 64°41.9  | .. 32.0  |  | 186°00.2 | .. 04.8  |  |
| 16                                                                                                                       | 214°55.1 |  | 18°40.4  | 51.7     |  | 114°00.8 | 30.9     |  | 79°43.9  | 31.9     |  | 201°02.8 | 04.8     |  |
| 17                                                                                                                       | 229°57.6 |  | 33°41.0  | 52.8     |  | 129°01.5 | 30.8     |  | 94°45.8  | 31.7     |  | 216°05.3 | 04.7     |  |
| 18                                                                                                                       | 245°00.1 |  | 48°41.5  | S09°53.9 |  | 144°02.2 | N23°30.8 |  | 109°47.7 | N17°31.6 |  | 231°07.9 | N03°04.7 |  |
| 19                                                                                                                       | 260°02.5 |  | 63°42.1  | 55.0     |  | 159°02.9 | 30.7     |  | 124°49.7 | 31.4     |  | 246°10.5 | 04.6     |  |
| 20                                                                                                                       | 275°05.0 |  | 78°42.7  | 56.1     |  | 174°03.7 | 30.6     |  | 139°51.6 | 31.3     |  | 261°13.1 | 04.5     |  |
| 21                                                                                                                       | 290°07.5 |  | 93°43.2  | .. 57.2  |  | 189°04.4 | .. 30.5  |  | 154°53.5 | .. 31.1  |  | 276°15.6 | .. 04.5  |  |
| 22                                                                                                                       | 305°09.9 |  | 108°43.8 | 58.3     |  | 204°05.1 | 30.4     |  | 169°55.4 | 31.0     |  | 291°18.2 | 04.4     |  |
| 23                                                                                                                       | 320°12.4 |  | 123°44.4 | 59.4     |  | 219°05.8 | 30.3     |  | 184°57.4 | 30.8     |  | 306°20.8 | 04.4     |  |
| Mer.pass. 01:43 $\nu$ 0.6' d 1.1' m -4.55 $\nu$ 0.7' d -0.1' m 1.26 $\nu$ 1.9' d -0.1' m -1.80 $\nu$ 2.6' d -0.1' m 0.51 |          |  |          |          |  |          |          |  |          |          |  |          |          |  |

| Stars       |          |            |
|-------------|----------|------------|
|             | SHA      | Dec        |
| Alpheratz   | 357°33.1 | 29°14.3    |
| Ankaa       | 353°05.5 | -42°09.4   |
| Schedar     | 349°29.0 | 56°41.0    |
| Diphda      | 348°45.7 | -17°50.2   |
| Achernar    | 335°18.8 | -57°05.7   |
| Hamal       | 327°49.5 | 23°35.4    |
| Polaris     | 313°13.0 | 89°22.3    |
| Acamar      | 315°10.6 | -40°11.5   |
| Menkar      | 314°04.0 | 4°11.8     |
| Mirfak      | 308°26.2 | 49°57.2    |
| Aldebaran   | 290°38.1 | 16°33.8    |
| Rigel       | 281°02.7 | -8°10.1    |
| Capella     | 280°20.0 | 46°01.3    |
| Bellatrix   | 278°21.5 | 6°22.5     |
| Elinath     | 278°00.3 | 28°37.7    |
| Anilam      | 275°36.5 | -1°11.0    |
| Betelgeuse  | 270°50.8 | 7°24.8     |
| Canopus     | 263°52.1 | -52°42.3   |
| Sirius      | 258°25.3 | -16°45.0   |
| Adhara      | 255°05.1 | -29°00.3   |
| Procyon     | 244°49.7 | 5°09.5     |
| Pollux      | 243°15.9 | 27°57.7    |
| Avior       | 234°14.8 | -59°35.5   |
| Suhail      | 222°45.7 | -43°32.3   |
| Miaplacidus | 221°38.9 | -69°49.5   |
| Alphard     | 217°46.7 | -8°46.4    |
| Regulus     | 207°33.3 | 11°50.3    |
| Dubhe       | 193°40.0 | 61°36.5    |
| Denebola    | 182°23.9 | 14°25.5    |
| Gienah      | 175°45.5 | -17°41.4   |
| Acrux       | 172°59.1 | -63°15.0   |
| Sirius      | 171°50.6 | -57°15.9   |
| Alloth      | 166°12.2 | 55°49.1    |
| Spica       | 158°21.1 | -11°12.0   |
| Alkaid      | 152°51.2 | 49°11.0    |
| Hadar       | 148°34.4 | -60°30.3   |
| Menkent     | 147°56.2 | -36°30.2   |
| Arcturus    | 145°46.8 | 19°02.8    |
| Rigel Kent  | 139°38.7 | -60°57.0</ |