

| h                |                             | Moon (21st Jun) |          |        |       | Lunar Distance (objects with largest hourly LD delta) |          |              |         |          |          |         |         |
|------------------|-----------------------------|-----------------|----------|--------|-------|---|----------|--------------|---------|----------|----------|---------|---------|
| Sun              | GHA                         | $\nu$           | Dec      | $d$    | HP    | -Altair   | -Antares | -Rigel Kent. | -Spica  | +Regulus | +Jupiter | +Pollux | +Sun    |
| 0                | 110°43.9                    | 14.3°           | N03°07.0 | -15.4° | 57.2° |   | 81°21.2  | 75°12.1      | 35°30.3 | 18°36.6  | 50°40.7  | 55°39.7 | 79°02.1 |
| 1                | 104°43.9                    | 14.4°           | 02°51.6  | -15.4° | 57.1° |   | 80°48.3  | 74°46.5      | 34°57.5 | 19°08.9  | 51°13.1  | 56°09.5 | 79°32.5 |
| 2                | 129°17.3                    | 14.4°           | 02°36.2  | -15.4° | 57.1° |   | 80°15.4  | 74°21.0      | 34°24.6 | 19°41.8  | 51°45.4  | 56°42.3 | 80°02.9 |
| 3                | 143°50.7                    | 14.5°           | 02°20.8  | -15.4° | 57.0° |   | 79°42.6  | 73°55.6      | 33°51.8 | 20°14.7  | 52°17.7  | 57°15.1 | 80°33.3 |
| 4                | 158°24.2                    | 14.5°           | 02°05.4  | -15.4° | 57.0° |   | 79°09.8  | 73°30.2      | 33°19.1 | 20°47.5  | 52°49.9  | 57°47.8 | 81°03.6 |
| 5                | 172°57.7                    | 14.6°           | 01°50.0  | -15.3° | 57.0° |   | 78°37.0  | 73°04.9      | 32°46.4 | 21°20.2  | 53°22.1  | 58°20.5 | 81°33.9 |
| 6                | 187°31.2                    | 14.6°           | N01°34.7 | -15.3° | 56.9° |   | 78°04.3  | 72°39.7      | 32°13.8 | 21°52.9  | 53°54.3  | 58°53.1 | 82°04.1 |
| 7                | 202°04.8                    | 14.6°           | 01°19.4  | -15.3° | 56.9° |   | 77°31.6  | 72°14.6      | 31°41.1 | 22°25.6  | 54°26.4  | 59°25.7 | 82°34.3 |
| 8                | 216°38.5                    | 14.7°           | 01°04.1  | -15.3° | 56.9° |   | 76°59.0  | 71°49.5      | 31°08.6 | 22°58.2  | 54°58.5  | 59°58.2 | 83°04.5 |
| 9                | 231°12.2                    | 14.7°           | 00°48.8  | -15.3° | 56.8° |   | 76°26.4  | 71°24.5      | 30°36.1 | 23°30.8  | 55°30.5  | 60°30.8 | 83°34.6 |
| 10               | 245°45.9                    | 14.8°           | 00°33.5  | -15.3° | 56.8° |   | 75°53.8  | 70°59.6      | 30°03.6 | 24°03.4  | 56°02.5  | 61°03.2 | 84°04.6 |
| 11               | 260°19.7                    | 14.8°           | 00°18.2  | -15.3° | 56.8° |   | 75°21.3  | 70°34.8      | 29°31.2 | 24°35.9  | 56°34.4  | 61°35.6 | 84°34.7 |
| 12               | 274°53.4                    | 14.8°           | N00°02.9 | -15.2° | 56.7° |   | 74°48.9  | 70°10.0      | 28°58.8 | 25°08.3  | 57°06.3  | 62°08.0 | 85°04.6 |
| 13               | 289°27.3                    | 14.9°           | S00°12.3 | -15.2° | 56.7° |   | 74°16.4  | 69°45.3      | 28°26.4 | 25°40.8  | 57°38.2  | 62°40.4 | 85°34.6 |
| 14               | 304°01.2                    | 14.9°           | 00°27.5  | -15.2° | 56.6° |   | 73°44.1  | 69°20.7      | 27°54.1 | 26°13.1  | 58°10.0  | 63°12.7 | 86°04.5 |
| 15               | 318°35.1                    | 14.9°           | 00°42.7  | -15.2° | 56.6° |   | 73°11.7  | 68°56.2      | 27°21.9 | 26°45.5  | 58°41.8  | 63°45.0 | 86°34.3 |
| 16               | 333°09.0                    | 15.0°           | 00°57.9  | -15.1° | 56.6° |   | 72°39.4  | 68°31.7      | 26°49.7 | 27°17.8  | 59°13.6  | 64°17.2 | 87°04.2 |
| 17               | 347°43.0                    | 15.0°           | 01°13.0  | -15.1° | 56.5° |   | 72°07.2  | 68°07.4      | 26°17.5 | 27°50.0  | 59°45.3  | 64°49.4 | 87°33.9 |
| 18               | 2°17.0                      | 15.0°           | S01°28.1 | -15.1° | 56.5° |   | 71°34.9  | 67°43.1      | 25°45.4 | 28°22.3  | 60°16.9  | 65°21.5 | 88°03.7 |
| 19               | 16°51.0                     | 15.1°           | 01°43.2  | -15.1° | 56.5° | 119°46.8  | 71°02.7  | 67°18.9      | 25°13.3 | 28°54.5  | 60°48.6  | 65°53.6 | 88°33.4 |
| 20               | 31°25.1                     | 15.1°           | 01°58.3  | -15.0° | 56.4° | 119°21.2  | 70°30.6  | 66°54.8      | 24°41.3 | 29°26.6  | 61°20.1  | 66°25.7 | 89°03.0 |
| 21               | 45°59.2                     | 15.1°           | 02°13.4  | -15.0° | 56.4° | 118°55.6  | 69°58.5  | 66°30.7      | 24°09.3 | 29°58.7  | 61°51.7  | 66°57.1 | 89°32.7 |
| 22               | 60°33.3                     | 15.1°           | 02°28.4  | -15.0° | 56.4° | 118°29.9  | 69°26.4  | 66°06.8      | 23°37.3 | 30°30.8  | 62°23.2  | 67°29.7 | 90°02.3 |
| 23               | 75°07.4                     | 15.2°           | 02°43.4  | -15.0° | 56.3° | 118°04.3  | 68°54.4  | 65°42.9      | 23°05.4 | 31°02.8  | 62°54.7  | 68°01.7 | 90°31.8 |
| 21 <sup>st</sup> | SD = 15.6' Mer. pass. 17:51 |                 |          |        |       | Sun SD = 15.7'  |          |              |         |          |          |         |         |

| h                |                             | Moon (24th Jun) |          |        |       | Lunar Distance (objects with largest hourly LD delta) |         |              |          |         |          |          |          |
|------------------|-----------------------------|-----------------|----------|--------|-------|---|---------|--------------|----------|---------|----------|----------|----------|
| Wed              | GHA                         | $\nu$           | Dec      | $d$    | HP    | -Fomalhaut  | -Altair | -Rigel Kent. | -Antares | +Spica  | +Regulus | +Jupiter | +Pollux  |
| 0                | 69°03.1                     | 14.8°           | S14°07.3 | -12.6° | 55.0° |   | 96°57.3 | 48°28.2      | 43°25.5  |         | 56°31.7  | 87°56.7  | 93°27.7  |
| 1                | 83°36.9                     | 14.8°           | 14°19.9  | -12.5° | 54.9° |   | 96°27.4 | 48°10.5      | 42°55.0  |         | 56°02.5  | 88°26.6  | 93°58.1  |
| 2                | 98°10.7                     | 14.7°           | 14°32.4  | -12.5° | 54.9° |   | 96°01.5 | 47°53.0      | 42°24.5  |         | 55°32.7  | 88°56.6  | 94°28.6  |
| 3                | 112°44.4                    | 14.7°           | 14°44.9  | -12.4° | 54.9° |   | 95°35.7 | 47°35.7      | 41°54.0  | 4°27.3  |          | 89°26.5  | 94°59.0  |
| 4                | 127°18.1                    | 14.7°           | 14°57.3  | -12.3° | 54.9° |   | 95°09.8 | 47°18.6      | 41°23.6  | 4°54.9  |          | 89°56.4  | 95°29.4  |
| 5                | 141°51.8                    | 14.6°           | 15°09.6  | -12.3° | 54.9° |   | 94°44.0 | 47°01.7      | 40°53.2  | 5°23.0  |          | 90°26.2  | 95°59.7  |
| 6                | 156°25.4                    | 14.6°           | S15°21.9 | -12.2° | 54.8° |   | 94°18.1 | 46°44.9      | 40°22.8  | 5°51.5  |          | 90°56.1  | 96°30.1  |
| 7                | 170°59.0                    | 14.6°           | 15°34.1  | -12.1° | 54.8° | 119°37.0  | 93°52.4 | 46°28.4      | 39°52.4  | 6°20.2  |          | 91°25.9  | 97°00.4  |
| 8                | 185°32.5                    | 14.5°           | 15°46.2  | -12.0° | 54.8° | 119°09.3  | 93°26.5 | 46°12.0      | 39°22.0  | 6°49.2  |          | 91°55.7  | 97°30.7  |
| 9                | 200°06.0                    | 14.5°           | 15°58.2  | -12.0° | 54.8° | 118°41.7  | 93°00.7 | 45°55.8      | 38°51.7  | 7°18.3  |          | 92°25.5  | 98°01.0  |
| 10               | 214°39.5                    | 14.4°           | 16°10.2  | -11.9° | 54.8° | 118°14.1  | 92°34.9 | 45°39.8      | 38°21.4  | 7°47.6  |          | 92°55.3  | 98°31.2  |
| 11               | 229°12.9                    | 14.4°           | 16°22.1  | -11.8° | 54.7° | 117°46.5  | 92°09.2 | 45°24.0      | 37°51.1  | 8°16.9  |          | 93°25.1  | 99°01.5  |
| 12               | 243°46.3                    | 14.4°           | S16°33.9 | -11.8° | 54.7° | 117°18.9  | 91°43.4 | 45°08.4      | 37°20.8  | 8°46.4  |          | 93°54.8  | 99°31.7  |
| 13               | 258°19.7                    | 14.3°           | 16°45.7  | -11.7° | 54.7° | 116°51.2  | 91°17.7 | 44°53.1      | 36°50.5  | 9°15.9  |          | 94°24.5  | 100°01.9 |
| 14               | 272°53.0                    | 14.3°           | 16°57.4  | -11.6° | 54.7° | 116°23.6  | 90°52.0 | 44°37.9      | 36°20.3  | 9°45.5  |          | 94°54.2  | 100°32.1 |
| 15               | 287°26.3                    | 14.2°           | 17°09.0  | -11.5° | 54.7° | 115°55.9  | 90°26.2 | 44°22.0      | 35°50.1  | 10°15.1 |          | 95°23.9  | 101°02.2 |
| 16               | 301°59.5                    | 14.2°           | 17°20.5  | -11.4° | 54.6° | 115°28.3  | 90°00.5 | 44°06.9      | 35°19.7  | 10°44.8 |          | 95°53.5  | 101°32.4 |
| 17               | 316°32.7                    | 14.1°           | 17°31.9  | -11.4° | 54.6° | 115°00.6  | 89°34.9 | 43°49.9      | 34°49.0  | 11°14.5 |          | 96°23.2  | 102°02.5 |
| 18               | 331°05.8                    | 14.1°           | S17°43.3 | -11.3° | 54.6° | 114°33.0  | 89°09.2 | 43°19.5      | 34°19.5  | 11°44.2 |          | 96°52.8  | 102°32.6 |
| 19               | 345°38.9                    | 14.0°           | 17°54.6  | -11.2° | 54.6° | 114°05.3  | 88°43.6 | 42°49.4      | 33°49.4  | 12°13.9 |          | 97°22.4  | 103°02.7 |
| 20               | 0°12.0                      | 14.0°           | 18°05.8  | -11.1° | 54.6° | 113°37.6  | 88°17.9 | 42°19.2      | 33°19.2  | 12°43.7 |          | 97°52.0  | 103°32.8 |
| 21               | 14°45.0                     | 14.0°           | 18°16.9  | -11.0° | 54.6° | 113°10.0  | 87°52.3 | 41°49.1      | 32°49.1  | 13°13.5 |          | 98°21.4  | 104°02.9 |
| 22               | 29°17.9                     | 13.9°           | 18°27.9  | -11.0° | 54.5° | 112°42.3  | 87°26.7 | 41°19.0      | 32°19.0  | 13°43.2 |          | 98°51.1  | 104°32.9 |
| 23               | 43°50.8                     | 13.9°           | 18°38.9  | -10.9° | 54.5° | 112°14.6  | 87°01.1 | 40°48.9      | 31°48.9  | 14°13.0 |          | 99°20.6  | 105°02.9 |
| 24 <sup>th</sup> | SD = 15.0' Mer. pass. 19:59 |                 |          |        |       |   |         |              |          |         |          |          |          |

| h                |                             | Moon (22nd Jun) |          |        |       | Lunar Distance (objects with largest hourly LD delta) |          |              |         |          |          |          |         |
|------------------|-----------------------------|-----------------|----------|--------|-------|---|----------|--------------|---------|----------|----------|----------|---------|
| Mon              | GHA                         | $\nu$           | Dec      | $d$    | HP    | -Altair   | -Antares | -Rigel Kent. | -Spica  | +Regulus | +Jupiter | +Procyon | +Pollux |
| 0                | 89°41.6                     | 15.2°           | S02°58.4 | -14.9° | 56.3° |   | 68°22.4  | 65°19.1      | 22°33.5 | 31°34.6  | 63°26.1  | 65°46.1  | 68°33.6 |
| 1                | 104°15.7                    | 15.2°           | 03°13.3  | -14.9° | 56.3° |   | 67°50.5  | 64°55.5      | 22°01.7 | 32°06.7  | 63°56.7  | 66°15.9  | 69°05.5 |
| 2                | 118°49.9                    | 15.2°           | 03°28.2  | -14.9° | 56.2° |   | 67°18.5  | 64°31.9      | 21°29.9 | 32°38.7  | 64°28.9  | 66°45.8  | 69°37.4 |
| 3                | 133°24.1                    | 15.2°           | 03°43.1  | -14.8° | 56.2° |   | 66°46.7  | 64°08.4      | 20°58.2 | 33°10.5  | 65°00.2  | 67°15.6  | 70°09.2 |
| 4                | 147°58.4                    | 15.2°           | 03°57.9  | -14.8° | 56.2° |   | 66°14.8  | 63°45.0      | 20°26.5 | 33°42.4  | 65°31.5  | 67°45.4  | 70°41.0 |
| 5                | 162°32.6                    | 15.3°           | 04°12.7  | -14.8° | 56.1° |   | 65°43.0  | 63°21.7      | 19°54.8 | 34°14.6  | 66°02.8  | 68°15.2  | 71°12.7 |
| 6                | 177°06.9                    | 15.3°           | S04°27.5 | -14.7° | 56.1° | 115°03.8  | 65°11.2  | 62°58.4      | 19°23.2 | 34°46.0  | 66°34.0  | 68°45.0  | 71°44.4 |
| 7                | 191°41.1                    | 15.3°           | 04°42.2  | -14.7° | 56.1° | 114°37.9  | 64°39.5  | 62°35.3      | 18°51.7 | 35°17.7  | 67°05.1  | 69°14.7  | 72°16.1 |
| 8                | 206°15.4                    | 15.3°           | 04°56.9  | -14.7° | 56.0° | 114°12.0  | 64°07.8  | 62°12.3      | 18°20.2 | 35°49.4  | 67°36.3  | 69°44.5  | 72°47.7 |
| 9                | 220°49.7                    | 15.3°           | 05°11.6  | -14.6° | 56.0° | 113°46.1  | 63°36.2  | 61°49.4      | 17°48.7 | 36°21.0  | 68°07.4  | 70°14.2  | 73°19.3 |
| 10               | 235°24.0                    | 15.3°           | 05°26.2  | -14.6° | 56.0° | 113°20.2  | 63°04.5  | 61°26.5      | 17°17.3 | 36°52.7  | 68°38.5  | 70°43.9  | 73°50.9 |
| 11               | 249°58.3                    | 15.3°           | 05°40.8  | -14.6° | 56.0° | 112°54.3  | 62°32.9  | 61°03.8      | 16°45.9 | 37°24.3  | 69°09.5  | 71°13.5  | 74°22.4 |
| 12               | 264°32.6                    | 15.3°           | S05°55.4 | -14.5° | 55.9° | 112°28.4  | 62°01.4  | 60°41.2      | 16°14.6 | 37°55.8  | 69°40.5  | 71°43.2  | 74°53.9 |
| 13               | 279°06.9                    | 15.3°           | 06°09.9  | -14.5° | 55.9° | 112°02.4  | 61°29.8  | 60°18.7      | 15°43.3 | 38°27.4  | 70°11.5  | 72°12.8  | 75°25.3 |
| 14               | 293°41.3                    | 15.3°           | 06°24.4  | -14.4° | 55.9° | 111°36.5  | 60°58.4  | 59°56.2      | 15°12.1 | 38°58.8  | 70°42.4  | 72°42.4  | 75°56.8 |
| 15               | 308°15.6                    | 15.3°           | 06°38.8  | -14.4° | 55.8° | 111°10.5  | 60°26.9  | 59°33.9      | 14°40.9 | 39°30.3  | 71°13.3  | 73°12.0  | 76°28.2 |
| 16               | 322°50.0                    | 15.3°           | 06°53.2  | -14.4° | 55.8° | 110°44.5  | 59°55.5  | 59°11.7      | 14°09.8 | 40°01.7  | 71°44.2  | 73°41.6  | 76°59.5 |
| 17               | 337°24.3                    | 15.3°           | 07°07.6  | -14.3° | 55.8° | 110°18.6  | 59°24.1  | 58°49.6      | 13°38.7 | 40°33.1  | 72°15.1  | 74°11.1  | 77°30.9 |
| 18               | 351°58.6                    | 15.3°           | S07°21.9 | -14.3° | 55.7° | 109°52.6  | 58°52.7  | 58°27.7      | 13°07.7 | 41°04.5  | 72°45.9  | 74°40.7  | 78°02.2 |
| 19               | 6°33.0                      | 15.3°           | 07°36.1  | -14.2° | 55.7° | 109°26.6  | 58°21.4  | 58°05.8      | 12°36.7 | 41°35.8  | 73°16.6  | 75°10.2  | 78°33.4 |
| 20               | 21°07.3                     | 15.3°           | 07°50.3  | -14.2° | 55.7° | 109°00.6  | 57°50.1  | 57°44.0      | 12°05.8 | 42°07.1  | 73°47.4  | 75°39.6  | 79°04.7 |
| 21               | 35°41.6                     | 15.3°           | 08°04.5  | -14.1° | 55.7° | 108°34.6  | 57°18.8  | 57°22.4      | 11°35.0 | 42°38.4  | 74°18.1  | 76°09.1  | 79°35.9 |
| 22               | 50°15.9                     | 15.3°           | 08°18.6  | -14.1° | 55.6° | 108°08.6  | 56°47.6  | 57°00.9      | 11°04.3 | 43°09.6  | 74°48.8  | 76°38.5  | 80°07.0 |
| 23               | 64°50.2                     | 15.3°           | 08°32.7  | -14.0° | 55.6° | 107°42.6  | 56°16.4  | 56°39.5      | 10°33.6 | 43°40.8  | 75°19.2  | 77°08.0  | 80°38.2 |
| 22 <sup>nd</sup> | SD = 15.4' Mer. pass. 18:33 |                 |          |        |       |   |          |              |         |          |          |          |         |

Table with columns: h, Moon (27th Jun), Lunar Distance (objects with largest hourly LD delta), Sat, GHA, nu, Dec, d, HP, -Deneb, -Fomalhaut, -Altair, +Antares, +Spica, +Arcturus, +Regulus, +Venus. Rows 0-23.

27th SD = 14.7' Mer. pass. 22:22

Table with columns: h, Moon (28th Jun), Lunar Distance (objects with largest hourly LD delta), Sat, GHA, nu, Dec, d, HP, -Saturn, -Deneb, -Fomalhaut, -Altair, +Antares, +Spica, +Regulus, +Venus. Rows 0-23.

28th SD = 14.7' Mer. pass. 23:14

Table with columns: h, Moon (29th Jun), Lunar Distance (objects with largest hourly LD delta), Sat, GHA, nu, Dec, d, HP, -Saturn, -Fomalhaut, -Altair, +Antares, +Hadar, +Spica, +Arcturus, +Regulus. Rows 0-23.

29th SD = 14.7' Mer. pass. --

Table with columns: h, Moon (30th Jun), Lunar Distance (objects with largest hourly LD delta), Tue, GHA, nu, Dec, d, HP, -Saturn, -Fomalhaut, -Altair, +Antares, +Rigel Kent., +Hadar, +Spica, +Arcturus. Rows 0-23.

30th SD = 14.7' Mer. pass. 00:05

Table with columns: h, Moon (1st Jul), Lunar Distance (objects with largest hourly LD delta), Wed, GHA, nu, Dec, d, HP, -Saturn, -Fomalhaut, +Antares, +Rigel Kent., +Hadar, +Acruz, +Spica, +Arcturus. Rows 0-23.

1st SD = 14.8' Mer. pass. 00:55

Table with columns: h, Moon (2nd Jul), Lunar Distance (objects with largest hourly LD delta), Thu, GHA, nu, Dec, d, HP, -Mars, -Aldebaran, -Saturn, -Fomalhaut, +Antares, +Rigel Kent., +Arcturus, +Spica. Rows 0-23.

2nd SD = 14.9' Mer. pass. 01:43

| h               |                             | Moon (3 <sup>rd</sup> Jul) |          |       |       | Lunar Distance (objects with largest hourly LD delta) |            |         |         |          |              |           |        |
|-----------------|-----------------------------|----------------------------|----------|-------|-------|---|------------|---------|---------|----------|--------------|-----------|--------|
| Fri             | GHA                         | $\nu$                      | Dec      | $d$   | HP    | -Capella  | -Aldebaran | -Mars   | -Saturn | +Antares | +Rigel Kent. | +Arcturus | +Spica |
| 0               | 323°45.9                    | 13.7°                      | S17°54.3 | 11.5' | 54.9° | 115°30.3  | 108°36.0   | 59°52.4 | 64°11.7 | 77°41.5  | 107°39.8     | 110°04.5  |        |
| 1               | 338°18.5                    | 13.7°                      | 17°42.8  | 11.5' | 54.9° | 115°00.3  | 108°07.3   | 59°22.1 | 64°42.3 | 78°05.5  | 108°30.4     | 110°35.1  |        |
| 2               | 352°51.2                    | 13.8°                      | 17°31.3  | 11.6' | 54.9° | 114°30.3  | 107°38.6   | 58°51.9 | 65°12.9 | 78°29.5  | 108°28.7     | 111°05.7  |        |
| 3               | 7°24.0                      | 13.8°                      | 17°19.6  | 11.7' | 54.9° | 114°00.3  | 107°09.9   | 58°21.5 | 65°43.5 | 78°53.5  | 108°53.2     | 111°36.3  |        |
| 4               | 21°56.8                     | 13.8°                      | 17°08.0  | 11.8' | 55.0° | 113°30.3  | 106°41.2   | 57°51.2 | 66°14.2 | 79°17.5  | 109°17.6     | 112°06.9  |        |
| 5               | 36°29.6                     | 13.9°                      | 16°56.2  | 11.9' | 55.0° | 113°00.2  | 106°12.4   | 57°20.9 | 66°44.8 | 79°41.6  | 109°42.0     | 112°37.6  |        |
| 6               | 51°02.5                     | 13.9°                      | S16°44.3 | 11.9' | 55.0° | 112°30.1  | 105°43.6   | 56°50.5 | 67°15.5 | 80°05.8  | 110°06.4     | 113°08.2  |        |
| 7               | 65°35.5                     | 14.0°                      | 16°32.4  | 12.0' | 55.0° | 112°00.0  | 105°14.9   | 56°20.2 | 67°46.2 | 80°29.9  | 110°30.7     | 113°38.9  |        |
| 8               | 80°08.5                     | 14.0°                      | 16°20.4  | 12.1' | 55.0° | 111°29.9  | 104°46.1   | 55°49.8 | 68°16.9 | 80°54.1  | 110°55.1     | 114°09.6  |        |
| 9               | 94°41.5                     | 14.1°                      | 16°08.3  | 12.2' | 55.0° | 110°59.8  | 104°17.2   | 55°19.4 | 68°47.7 | 81°18.3  | 111°19.4     | 114°40.3  |        |
| 10              | 109°14.5                    | 14.1°                      | 15°56.1  | 12.2' | 55.1° | 110°29.6  | 103°48.4   | 54°49.0 | 69°18.4 | 81°42.6  | 111°43.7     | 115°11.0  |        |
| 11              | 123°47.7                    | 14.2°                      | 15°43.9  | 12.3' | 55.1° | 109°59.4  | 103°19.5   | 54°18.5 | 69°49.2 | 82°06.8  | 112°07.9     | 115°41.8  |        |
| 12              | 138°20.8                    | 14.2°                      | S15°31.6 | 12.4' | 55.1° | 109°29.2  | 102°50.7   | 53°48.1 | 70°20.0 | 82°31.1  | 112°32.1     | 116°12.6  |        |
| 13              | 152°54.0                    | 14.2°                      | 15°19.2  | 12.4' | 55.1° | 108°59.0  | 102°21.8   | 53°17.6 | 70°50.8 | 82°55.5  | 112°56.3     | 116°43.3  |        |
| 14              | 167°27.2                    | 14.3°                      | 15°06.8  | 12.5' | 55.1° | 108°28.7  | 101°52.9   | 52°47.2 | 71°21.6 | 83°19.8  | 113°20.5     | 117°14.1  |        |
| 15              | 182°00.5                    | 14.3°                      | 14°54.2  | 12.6' | 55.2° | 107°58.5  | 101°23.9   | 52°16.7 | 71°52.5 | 83°44.2  | 113°44.6     | 117°45.0  |        |
| 16              | 196°33.8                    | 14.4°                      | 14°41.7  | 12.7' | 55.2° | 107°28.2  | 100°55.0   | 51°46.2 | 72°23.4 | 84°08.6  | 114°08.8     | 118°15.8  |        |
| 17              | 211°07.0                    | 14.4°                      | 14°29.0  | 12.7' | 55.2° | 106°57.8  | 100°26.0   | 51°15.6 | 72°54.2 | 84°33.1  | 114°32.8     | 118°46.7  |        |
| 18              | 225°40.6                    | 14.4°                      | S14°16.3 | 12.8' | 55.2° | 106°27.5  | 99°57.0    | 50°45.1 | 73°25.1 | 84°57.6  | 114°56.9     | 119°17.6  |        |
| 19              | 240°14.0                    | 14.5°                      | 14°03.5  | 12.9' | 55.2° | 105°57.1  | 99°28.0    | 50°14.6 | 73°56.1 | 85°22.0  | 115°20.9     | 119°48.5  |        |
| 20              | 254°47.5                    | 14.5°                      | 13°50.6  | 12.9' | 55.3° | 105°26.8  | 98°58.9    | 49°44.0 | 74°27.0 | 85°46.6  | 115°44.8     |           |        |
| 21              | 269°20.9                    | 14.5°                      | 13°37.7  | 13.0' | 55.3° | 104°56.4  | 98°29.9    | 49°13.4 | 74°58.0 | 86°11.1  | 116°08.7     |           |        |
| 22              | 283°54.5                    | 14.6°                      | 13°24.7  | 13.1' | 55.3° | 104°25.9  | 98°00.8    | 48°42.8 | 75°29.0 | 86°35.7  | 116°32.6     |           |        |
| 23              | 298°28.0                    | 14.6°                      | 13°11.7  | 13.1' | 55.3° | 103°55.5  | 97°31.7    | 48°12.2 | 76°00.0 | 87°00.3  | 116°56.5     |           |        |
| 3 <sup>rd</sup> | SD = 15.0' Mer. pass. 02:29 |                            |          |       |       |   |            |         |         |          |              |           |        |

| h               |                             | Moon (6 <sup>th</sup> Jul) |          |       |       | Lunar Distance (objects with largest hourly LD delta) |            |         |         |            |         |          |              |
|-----------------|-----------------------------|----------------------------|----------|-------|-------|---|------------|---------|---------|------------|---------|----------|--------------|
| Mon             | GHA                         | $\nu$                      | Dec      | $d$   | HP    | -Capella  | -Aldebaran | -Mars   | -Saturn | +Fomalhaut | +Altair | +Antares | +Rigel Kent. |
| 0               | 292°13.7                    | 15.0°                      | S01°31.7 | 15.2' | 56.5° | 89°38.2   | 78°33.9    | 73°17.1 | 22°56.6 | 28°44.7    | 54°33.3 | 101°48.1 | 107°19.2     |
| 1               | 306°47.6                    | 14.9°                      | 01°16.5  | 15.2' | 56.5° | 89°07.6   | 78°02.2    | 72°46.7 | 22°25.6 | 29°04.9    | 54°58.0 | 102°20.4 | 107°44.1     |
| 2               | 321°21.6                    | 14.9°                      | 01°01.4  | 15.2' | 56.6° | 88°36.9   | 77°30.4    | 72°16.3 | 21°54.6 | 29°26.5    | 55°22.8 | 102°52.7 | 108°08.9     |
| 3               | 335°55.5                    | 14.9°                      | 00°46.2  | 15.2' | 56.6° | 88°06.1   | 76°58.7    | 71°45.9 | 21°42.7 | 29°48.3    | 55°47.8 | 103°25.0 | 108°33.7     |
| 4               | 350°29.4                    | 14.9°                      | 00°31.0  | 15.2' | 56.6° | 87°35.3   | 76°26.9    | 71°15.5 | 20°52.8 | 30°10.5    | 56°12.8 | 103°57.4 | 108°58.5     |
| 5               | 5°05.3                      | 14.8°                      | 00°15.7  | 15.2' | 56.7° | 87°04.6   | 75°55.1    | 70°45.0 | 20°21.9 | 30°32.9    | 56°38.0 | 104°29.8 | 109°23.3     |
| 6               | 19°37.1                     | 14.8°                      | S00°05.5 | 15.3' | 56.7° | 86°33.7   | 75°23.2    | 70°14.5 | 19°51.1 | 30°55.7    | 57°03.2 | 105°02.2 | 109°48.1     |
| 7               | 34°10.9                     | 14.8°                      | 00°00.0  | 15.3' | 56.7° | 86°02.9   | 74°51.4    | 69°44.0 | 19°20.3 | 31°18.7    | 57°28.6 | 105°34.6 | 110°12.8     |
| 8               | 48°44.7                     | 14.8°                      | 00°30.0  | 15.3' | 56.7° | 85°32.0   | 74°19.5    | 69°13.4 | 18°49.6 | 31°42.0    | 57°54.1 | 106°07.1 | 110°37.6     |
| 9               | 63°18.5                     | 14.7°                      | 00°45.3  | 15.3' | 56.8° | 85°01.1   | 73°47.6    | 68°42.8 | 18°18.9 | 32°05.5    | 58°19.6 | 106°39.7 | 111°02.3     |
| 10              | 77°52.2                     | 14.7°                      | 01°00.6  | 15.3' | 56.8° | 84°30.2   | 73°15.6    | 68°12.2 | 17°48.3 | 32°29.3    | 58°45.3 | 107°12.2 | 111°26.9     |
| 11              | 92°25.9                     | 14.7°                      | 01°15.9  | 15.3' | 56.8° | 83°59.2   | 72°43.6    | 67°41.5 | 17°17.8 | 32°53.4    | 59°11.1 | 107°44.8 | 111°51.6     |
| 12              | 106°59.6                    | 14.6°                      | N01°31.2 | 15.3' | 56.9° | 83°28.2   | 72°11.6    | 67°10.8 | 16°47.4 | 33°17.7    | 59°36.9 | 108°17.4 | 112°16.2     |
| 13              | 121°33.2                    | 14.6°                      | 01°46.6  | 15.3' | 56.9° | 82°57.2   | 71°39.6    | 66°40.1 | 16°17.1 | 33°42.2    | 60°02.9 | 108°50.1 | 112°40.8     |
| 14              | 136°06.8                    | 14.5°                      | 02°01.9  | 15.3' | 56.9° | 82°26.1   | 71°07.5    | 66°09.4 | 15°46.9 | 34°07.0    | 60°28.9 | 109°22.7 | 113°05.3     |
| 15              | 150°40.3                    | 14.5°                      | 02°17.3  | 15.3' | 56.9° | 81°55.0   | 70°35.4    | 65°38.6 | 15°16.8 | 34°32.0    | 60°55.0 | 109°55.5 | 113°29.8     |
| 16              | 165°13.8                    | 14.5°                      | 02°32.6  | 15.4' | 57.0° | 81°23.9   | 70°03.3    | 65°07.8 | 14°46.9 | 34°57.1    | 61°21.2 | 110°28.2 | 113°54.3     |
| 17              | 179°47.3                    | 14.4°                      | 02°48.0  | 15.4' | 57.0° | 80°52.8   | 69°31.1    | 64°36.9 | 14°17.1 | 35°22.1    | 61°47.5 | 111°01.0 | 114°18.8     |
| 18              | 194°20.7                    | 14.4°                      | N03°03.3 | 15.4' | 57.0° | 80°21.7   | 68°58.9    | 64°06.0 | 13°47.6 | 35°48.1    | 62°13.9 | 111°33.8 | 114°43.2     |
| 19              | 208°54.1                    | 14.3°                      | 03°18.7  | 15.4' | 57.1° | 79°50.5   | 68°26.7    | 63°35.1 | 13°18.2 | 36°13.9    | 62°40.4 | 112°06.7 | 115°07.6     |
| 20              | 223°27.4                    | 14.3°                      | 03°34.0  | 15.4' | 57.1° | 79°19.3   | 67°54.5    | 63°04.2 | 12°49.1 | 36°39.9    | 63°07.0 | 112°39.5 | 115°31.9     |
| 21              | 238°00.7                    | 14.2°                      | 03°49.4  | 15.4' | 57.1° | 78°48.0   | 67°22.2    | 62°33.2 | 12°20.2 | 37°06.1    | 63°33.6 | 113°12.5 | 115°56.2     |
| 22              | 252°33.9                    | 14.2°                      | 04°04.8  | 15.4' | 57.2° | 78°16.8   | 66°49.9    | 62°02.2 | 11°51.7 | 37°32.4    | 64°00.3 | 113°45.4 | 116°20.4     |
| 23              | 267°07.1                    | 14.1°                      | 04°20.1  | 15.4' | 57.2° | 77°45.5   | 66°17.6    | 61°31.1 | 11°23.5 | 37°58.9    | 64°27.1 | 114°18.4 | 116°44.6     |
| 6 <sup>th</sup> | SD = 15.4' Mer. pass. 04:39 |                            |          |       |       |   |            |         |         |            |         |          |              |

| h   |          | Moon (4 <sup>th</sup> Jul) |          |       |       | Lunar Distance (objects with largest hourly LD delta) |            |         |         |          |              |          |           |
|-----|----------|----------------------------|----------|-------|-------|---|------------|---------|---------|----------|--------------|----------|-----------|
| Sat | GHA      | $\nu$                      | Dec      | $d$   | HP    | -Capella  | -Aldebaran | -Mars   | -Saturn | +Antares | +Rigel Kent. | +Hadad   | +Arcturus |
| 0   | 313°01.6 | 14.6°                      | S12°58.5 | 13.2' | 55.3° | 113°36.0  | 103°25.0   | 97°02.6 | 47°41.6 | 76°31.0  | 87°24.9      | 91°31.3  | 117°20.3  |
| 1   | 327°35.3 | 14.7°                      | 12°45.4  | 13.2' | 55.4° | 113°06.8  | 102°54.5   | 96°33.5 | 47°10.9 | 77°02.0  | 87°49.5      | 91°55.4  | 117°44.0  |
| 2   | 342°08.9 | 14.7°                      | 12°32.1  | 13.3' | 55.4° | 112°37.3  | 102°24.0   | 96°04.3 | 46°40.3 | 77°33.1  | 88°14.1      | 92°19.5  | 118°07.7  |
| 3   | 356°42.6 | 14.7°                      | 12°18.8  | 13.4' | 55.4° | 112°08.3  | 101°53.5   | 95°35.1 | 46°09.6 | 78°04.2  | 88°38.8      | 92°43.6  | 118°31.4  |
| 4   | 1°11.6   | 14.7°                      | 12°05.5  | 13.4' | 55.4° | 111°38.9  | 101°22.9   | 95°05.9 | 45°38.9 | 78°35.3  | 89°03.5      | 93°07.8  | 118°55.0  |
| 5   | 25°50.1  | 14.8°                      | 11°52.1  | 13.5' | 55.4° | 111°09.6  | 100°52.3   | 94°36.7 | 45°08.2 | 79°06.4  | 89°31.9      | 93°31.9  | 119°18.5  |
| 6   | 40°23.8  | 14.8°                      | S11°38.6 | 13.5' | 55.5° | 110°40.2  | 100°21.7   | 94°07.5 | 44°37.5 | 79°37.6  | 89°52.9      | 93°56.1  | 119°42.1  |
| 7   | 54°57.6  | 14.8°                      | 11°25.1  | 13.6' | 55.5° | 110°10.8  | 99°51.1    | 93°38.2 | 44°06.7 | 80°08.8  | 90°17.4      | 94°20.3  |           |
| 8   | 69°31.5  | 14.8°                      | 11°11.5  | 13.6' | 55.5° | 109°41.3  | 99°20.4    | 93°08.9 | 43°36.0 | 80°40.0  | 90°42.4      | 94°44.5  |           |
| 9   | 84°05.3  | 14.9°                      | 10°57.8  | 13.7' | 55.5° | 109°11.8  | 98°49.7    | 92°39.6 | 43°05.2 | 81°11.2  | 91°07.2      | 95°08.6  |           |
| 10  | 98°39.2  | 14.9°                      | 10°44.1  | 13.8' | 55.5° | 108°42.3  | 98°19.0    | 92°10.2 | 42°34.4 | 81°42.4  | 91°32.0      | 95°32.8  |           |
| 11  | 113°13.1 | 14.9°                      | 10°30.4  | 13.8' | 55.6° | 108°12.8  | 97°48.3    | 91°40.9 | 42°03.6 | 82°13.7  | 91°56.8      | 95°57.1  |           |
| 12  | 127°47.0 | 14.9°                      | S10°16.6 | 13.9' | 55.6° | 107°43.2  | 97°17.5    | 91°11.5 | 41°32.0 | 82°45.0  | 92°21.6      | 96°21.3  |           |
| 13  | 142°20.9 | 15.0°                      | 10°02.7  | 13.9' | 55.6° | 107°13.6  | 96°46.8    | 90°42.1 | 41°02.0 | 83°16.3  | 92°46.6      | 96°46.6  |           |
| 14  | 156°54.9 | 15.0°                      | 09°48.8  | 14.0' | 55.6° | 106°44.0  | 96°16.0    | 90°12.7 | 40°31.1 | 83°47.6  | 93°11.3      | 97°09.7  |           |
| 15  | 171°28.9 | 15.0°                      | 09°34.9  | 14.0' | 55.7° | 106°14.3  | 95°45.2    | 89°43.2 | 40°00.3 | 84°19.0  | 93°36.2      | 97°33.9  |           |
| 16  | 186°02.9 | 15.0°                      | 09°20.9  | 14.1' | 55.7° | 105°44.6  | 95°14.3    | 89°13.8 | 39°29.4 | 84°50.3  | 94°01.1      | 97°58.1  |           |
| 17  | 200°36.9 | 15.0°                      | 09°06.8  | 14.1' | 55.7° | 105°14.8  | 94°43.4    | 88°44.3 | 38°58.5 | 85°21.4  | 94°26.0      | 98°25.4  |           |
| 18  | 215°10.9 | 15.0°                      | S08°52.7 | 14.1' | 55.7° | 104°45.1  | 94°12.5    | 88°14.7 | 38°27.6 | 85°53.2  | 94°50.9      | 98°46.6  |           |
| 19  | 229°45.0 | 15.1°                      | 08°38.6  | 14.2' | 55.8° | 104°15.3  | 93°41.6    | 87°45.2 | 37°56.7 | 86°24.6  | 95°15.3      | 99°10.8  |           |
| 20  | 244°19.0 | 15.1°                      | 08°24.4  | 14.2' | 55.8° | 103°45.5  | 93°10.7    | 87°15.6 | 37°25.8 | 86°56.1  | 95°40.7      | 99°35.1  |           |
| 21  | 258°53.1 | 15.1°                      | 08°10.1  | 14.3' | 55.8° | 103°15.6  | 92°39.7    | 86°46.0 | 36°54.8 | 87°27.6  | 96°05.6      | 99°59.3  |           |
| 22  | 273°27.2 | 15.1°                      | 07°55.8  | 14.3' | 55.8° | 102°45.7  | 92°08.7    | 86°16.4 | 36°23.9 | 87°59.1  | 96°30.5      | 100°23.5 |           |
| 23  | 288°01.3 | 15.1°                      | 07°41.5  | 14.4' | 55.9° | 102°15.8  | 91°37.7    | 85°46   |         |          |              |          |           |

| h               |            | Moon (9 <sup>th</sup> Jul) |          |       |                  | Lunar Distance (objects with largest hourly LD delta) |          |            |         |         |            |           |         |
|-----------------|------------|----------------------------|----------|-------|------------------|---|----------|------------|---------|---------|------------|-----------|---------|
| Thu             | GHA        | $\nu$                      | Dec      | d     | HP               | -Sun  | -Capella | -Aldebaran | -Mars   | +Saturn | +Fomalhaut | +Achernar | +Altair |
| 0               | 258°43.4   | 9.9°                       | N16°25.3 | 13.6° | 58.8'            | 74°51.0   | 51°46.8  | 39°22.1    | 35°28.0 | 18°51.6 | 62°09.0    | 87°40.4   |         |
| 1               | 273°12.3   | 9.8°                       | 16°38.9  | 13.6° | 58.8'            | 74°18.5   | 51°14.7  | 38°48.7    | 34°55.2 | 19°24.7 | 62°40.8    | 88°10.1   |         |
| 2               | 287°41.1   | 9.7°                       | 16°52.5  | 13.5° | 58.9'            | 73°46.0   | 50°42.7  | 38°15.2    | 34°22.5 | 19°57.9 | 63°12.7    | 88°39.8   |         |
| 3               | 302°09.8   | 9.6°                       | 17°05.9  | 13.4° | 58.9'            | 73°13.4   | 50°10.6  | 37°41.8    | 33°49.7 | 20°31.2 | 63°44.7    | 89°09.6   |         |
| 4               | 316°38.4   | 9.4°                       | 17°19.3  | 13.3° | 58.9'            | 72°40.8   | 49°38.6  | 37°08.4    | 33°16.9 | 21°04.6 | 64°16.7    | 74°34.6   | 89°39.4 |
| 5               | 331°06.8   | 9.3°                       | 17°32.7  | 13.2° | 59.0'            | 72°08.2   | 49°06.6  | 36°35.0    | 32°44.0 | 21°38.1 | 64°48.8    | 74°49.8   | 90°09.3 |
| 6               | 345°35.2   | 9.2°                       | N17°45.9 | 13.2° | 59.0'            | 71°35.8   | 48°34.6  | 36°01.6    | 32°11.2 | 22°11.8 | 65°20.9    | 75°05.1   | 90°39.2 |
| 7               | 0°03.4     | 9.1°                       | 17°59.1  | 13.1° | 59.0'            | 71°02.5   | 48°02.6  | 35°28.2    | 31°38.3 | 22°45.6 | 65°53.2    | 75°20.6   | 91°09.1 |
| 8               | 14°31.4    | 9.0°                       | 18°12.1  | 13.0° | 59.1'            | 70°30.1   | 47°30.6  | 34°54.9    | 31°05.4 | 23°19.4 | 66°25.5    | 75°36.1   | 91°39.1 |
| 9               | 28°59.4    | 8.8°                       | 18°25.1  | 12.9° | 59.1'            | 69°57.3   | 46°58.7  | 34°21.5    | 30°32.4 | 23°53.4 | 66°57.8    | 75°51.7   | 92°09.1 |
| 10              | 43°27.2    | 8.7°                       | 18°38.0  | 12.8° | 59.1'            | 69°24.5   | 46°26.7  | 33°48.1    | 29°59.5 | 24°27.5 | 67°30.2    | 76°07.4   | 92°39.1 |
| 11              | 57°54.9    | 8.6°                       | 18°50.8  | 12.7° | 59.2'            | 68°51.6   | 45°54.8  | 33°14.8    | 29°26.5 | 25°01.6 | 68°02.7    | 76°23.2   | 93°09.2 |
| 12              | 72°22.5    | 8.4°                       | N19°03.5 | 12.6° | 59.2'            | 68°18.7   | 45°23.0  | 32°41.5    | 28°53.5 | 25°35.8 | 68°35.2    | 76°39.1   | 93°39.2 |
| 13              | 86°49.9    | 8.3°                       | 19°16.1  | 12.5° | 59.2'            | 67°45.7   | 44°51.1  | 32°08.2    | 28°20.5 | 26°10.1 | 69°07.8    | 76°55.0   | 94°09.3 |
| 14              | 101°17.2   | 8.2°                       | 19°28.6  | 12.4° | 59.3'            | 67°12.7   | 44°19.3  | 31°35.0    | 27°47.5 | 26°44.5 | 69°40.5    | 77°11.1   | 94°39.5 |
| 15              | 115°44.4   | 8.1°                       | 19°41.1  | 12.3° | 59.3'            | 66°39.9   | 43°47.6  | 31°01.8    | 27°14.4 | 27°19.0 | 70°13.2    | 77°27.2   | 95°09.6 |
| 16              | 130°11.5   | 7.9°                       | 19°53.4  | 12.2° | 59.3'            | 66°06.6   | 43°15.8  | 30°28.6    | 26°41.4 | 27°53.6 | 70°45.9    | 77°43.4   | 95°39.8 |
| 17              | 144°38.4   | 7.8°                       | 20°05.6  | 12.1° | 59.4'            | 65°33.3   | 42°44.2  | 29°55.5    | 26°08.3 | 28°28.2 | 71°18.8    | 77°59.7   | 95°10.0 |
| 18              | 159°05.2   | 7.7°                       | N20°17.7 | 12.0° | 59.4'            | 65°00.4   | 42°12.5  | 29°22.4    | 25°35.2 | 29°02.9 | 71°51.6    | 78°16.1   | 96°40.3 |
| 19              | 173°31.8   | 7.5°                       | 20°29.7  | 11.9° | 59.4'            | 64°27.2   | 41°40.9  | 28°49.4    | 25°02.1 | 29°37.6 | 72°24.6    | 78°32.6   | 97°10.5 |
| 20              | 187°58.4   | 7.4°                       | 20°41.6  | 11.8° | 59.4'            | 63°54.0   | 41°09.4  | 28°16.4    | 24°29.0 | 30°12.5 | 72°57.5    | 78°49.1   | 97°40.8 |
| 21              | 202°24.7   | 7.3°                       | 20°53.4  | 11.7° | 59.5'            | 63°20.7   | 40°37.9  | 27°43.5    | 23°55.9 | 30°47.3 | 73°30.6    | 79°05.7   | 98°11.1 |
| 22              | 216°51.0   | 7.1°                       | 21°05.0  | 11.5° | 59.5'            | 62°47.4   | 40°06.5  | 27°10.7    | 23°22.8 | 31°22.3 | 74°03.7    | 79°22.4   | 98°41.4 |
| 23              | 231°17.1   | 7.0°                       | 21°16.6  | 11.4° | 59.5'            | 62°14.0   | 39°35.2  | 26°38.0    | 22°49.7 | 31°57.3 | 74°39.2    | 79°39.2   | 99°11.7 |
| 9 <sup>th</sup> | SD = 16.0' |                            |          |       | Mer. pass. 07:00 | Sun SD = 15.7'  |          |            |         |         |            |           |         |

| h                |            | Moon (12 <sup>th</sup> Jul) |          |       |                  | Lunar Distance (objects with largest hourly LD delta) |         |             |         |            |          |        |            |
|------------------|------------|-----------------------------|----------|-------|------------------|---|---------|-------------|---------|------------|----------|--------|------------|
| Sun              | GHA        | $\nu$                       | Dec      | d     | HP               | -Adhara   | -Sirius | -Betelgeuse | +Mars   | +Aldebaran | +Saturn  | +Deneb | +Fomalhaut |
| 0                | 216°02.4   | 1.4°                        | N27°37.0 | 3.2°  | 60.7'            | 63°57.1   | 51°51.7 | 24°51.1     | 61°31.0 | 90°39.9    | 102°27.6 |        |            |
| 1                | 230°22.8   | 1.3°                        | 27°40.2  | 3.0°  | 60.7'            | 63°41.3   | 51°33.4 | 24°30.8     | 62°08.1 | 90°59.1    | 103°02.3 |        |            |
| 2                | 244°43.1   | 1.3°                        | 27°43.1  | 2.7°  | 60.8'            | 63°25.7   | 51°15.4 | 24°11.1     | 62°45.2 | 91°18.3    | 103°37.0 |        |            |
| 3                | 259°03.4   | 1.2°                        | 27°45.9  | 2.5°  | 60.8'            | 63°10.2   | 50°57.6 | 23°52.1     | 63°22.3 | 91°37.6    | 104°11.7 |        |            |
| 4                | 273°23.6   | 1.2°                        | 27°48.4  | 2.3°  | 60.8'            | 62°54.9   | 50°40.1 | 23°33.8     | 63°59.5 | 91°56.8    | 104°46.4 |        |            |
| 5                | 287°43.8   | 1.1°                        | 27°50.7  | 2.1°  | 60.8'            | 62°39.7   | 50°22.8 | 23°16.2     | 64°36.6 | 92°16.1    | 105°21.1 |        |            |
| 6                | 302°03.9   | 1.1°                        | N27°52.8 | 1.9°  | 60.8'            | 50°05.7   | 22°59.3 | 11°09.1     | 65°13.8 | 92°35.3    | 105°55.8 |        |            |
| 7                | 316°23.9   | 1.0°                        | 27°54.7  | 1.7°  | 60.8'            | 49°49.0   | 22°43.2 | 11°40.7     | 65°51.0 | 92°54.5    | 106°30.5 |        |            |
| 8                | 330°44.0   | 1.0°                        | 27°56.4  | 1.5°  | 60.8'            | 49°32.5   | 22°27.9 | 12°12.8     | 66°28.3 | 93°13.8    | 107°05.3 |        |            |
| 9                | 345°03.9   | 0.9°                        | 27°57.9  | 1.2°  | 60.8'            | 49°16.5   | 22°12.8 | 14°44.1     | 66°05.5 | 93°33.0    | 107°40.0 |        |            |
| 10               | 359°23.9   | 0.9°                        | 27°59.1  | 1.0°  | 60.9'            | 48°00.3   | 13°17.9 | 15°37.8     | 67°42.8 | 93°52.2    | 108°14.7 |        |            |
| 11               | 13°43.8    | 0.9°                        | 28°00.1  | 0.8°  | 60.9'            | 48°44.7   | 13°50.9 | 16°05.7     | 68°20.1 | 94°11.4    | 108°49.3 |        |            |
| 12               | 28°03.7    | 0.9°                        | N28°00.9 | 0.6°  | 60.9'            | 48°29.3   | 14°24.1 | 16°34.3     | 68°57.4 | 94°30.6    | 109°24.0 |        |            |
| 13               | 42°23.5    | 0.8°                        | 28°01.5  | 0.4°  | 60.9'            | 48°14.2   | 14°57.5 | 17°03.4     | 69°34.7 | 94°49.8    | 109°58.7 |        |            |
| 14               | 56°43.4    | 0.8°                        | 28°01.9  | 0.1°  | 60.9'            | 48°00.3   | 15°31.1 | 17°33.0     | 70°12.0 | 95°08.9    | 110°33.4 |        |            |
| 15               | 71°03.2    | 0.8°                        | 28°02.0  | -0.1° | 60.9'            | 47°46.9   | 16°04.9 | 18°03.2     | 70°49.4 | 95°28.0    | 111°08.0 |        |            |
| 16               | 85°23.0    | 0.8°                        | 28°02.0  | -0.3° | 60.9'            | 47°32.8   | 16°38.8 | 18°33.8     | 71°26.7 | 95°47.1    | 111°42.7 |        |            |
| 17               | 99°42.8    | 0.8°                        | 28°01.7  | -0.5° | 60.9'            | 47°18.9   | 17°12.9 | 19°04.8     | 72°04.1 | 96°06.2    | 112°17.3 |        |            |
| 18               | 114°02.6   | 0.8°                        | N28°01.2 | -0.7° | 60.9'            | 47°04.1   | 17°47.1 | 19°36.2     | 72°41.5 | 96°25.3    | 112°51.9 |        |            |
| 19               | 128°22.4   | 0.8°                        | 28°00.4  | -1.0° | 60.9'            | 46°49.3   | 18°21.5 | 20°07.9     | 73°18.9 | 96°44.3    | 113°26.5 |        |            |
| 20               | 142°42.1   | 0.8°                        | 27°59.5  | -1.2° | 60.9'            | 46°35.0   | 18°55.9 | 20°40.0     | 73°56.3 | 97°03.3    | 114°01.1 |        |            |
| 21               | 157°01.9   | 0.8°                        | 27°58.3  | -1.4° | 61.0'            | 46°20.8   | 19°30.4 | 21°12.4     | 74°33.7 | 97°22.3    | 114°35.7 |        |            |
| 22               | 171°21.7   | 0.8°                        | 27°56.9  | -1.6° | 61.0'            | 46°06.5   | 20°05.0 | 21°45.1     | 75°11.2 | 97°41.2    | 115°10.2 |        |            |
| 23               | 185°41.5   | 0.8°                        | 27°55.3  | -1.8° | 61.0'            | 45°52.2   | 20°39.7 | 22°18.0     | 75°48.6 | 98°00.1    | 115°44.7 |        |            |
| 12 <sup>th</sup> | SD = 16.6' |                             |          |       | Mer. pass. 10:03 |   |         |             |         |            |          |        |            |

| h                |            | Moon (10 <sup>th</sup> Jul) |          |       |                  | Lunar Distance (objects with largest hourly LD delta) |             |            |         |         |            |         |          |
|------------------|------------|-----------------------------|----------|-------|------------------|---|-------------|------------|---------|---------|------------|---------|----------|
| Thu              | GHA        | $\nu$                       | Dec      | d     | HP               | -Sun  | -Betelgeuse | -Aldebaran | -Mars   | +Saturn | +Fomalhaut | +Deneb  | +Altair  |
| 0                | 245°43.1   | 6.9°                        | N21°28.0 | 11.3° | 59.6'            | 61°40.7   | 47°21.5     | 26°05.3    | 22°16.7 | 32°32.4 | 75°10.0    | 76°00.1 | 99°42.1  |
| 1                | 260°09.0   | 6.7°                        | 21°39.3  | 11.2° | 59.6'            | 61°07.2   | 46°50.0     | 25°32.8    | 21°43.6 | 33°07.6 | 75°43.2    | 76°16.9 | 100°12.4 |
| 2                | 274°34.7   | 6.6°                        | 21°50.5  | 11.1° | 59.6'            | 60°33.8   | 46°18.6     | 25°00.3    | 21°10.5 | 33°42.8 | 76°16.5    | 76°33.8 | 100°42.8 |
| 3                | 289°00.3   | 6.4°                        | 22°01.6  | 10.9° | 59.7'            | 60°00.3   | 45°47.2     | 24°28.0    | 20°37.5 | 34°18.0 | 76°49.9    | 76°50.8 | 101°13.2 |
| 4                | 303°25.7   | 6.3°                        | 22°12.5  | 10.8° | 59.7'            | 59°26.8   | 45°15.8     | 23°55.8    | 20°04.5 | 34°53.3 | 77°23.3    | 77°07.8 | 101°43.6 |
| 5                | 317°51.0   | 6.2°                        | 22°23.3  | 10.7° | 59.7'            | 58°53.2   | 44°44.6     | 23°23.7    | 19°31.5 | 35°28.7 | 77°56.7    | 77°25.0 | 102°14.0 |
| 6                | 332°16.2   | 6.0°                        | N22°34.0 | 10.5° | 59.7'            | 58°19.6   | 44°13.3     | 22°51.8    | 18°58.5 | 36°04.1 | 78°30.2    | 77°42.2 | 102°44.4 |
| 7                | 346°41.2   | 5.9°                        | 22°44.5  | 10.4° | 59.8'            | 57°45.9   | 43°42.2     | 22°20.1    | 18°25.6 | 36°39.6 | 79°03.7    | 77°59.6 | 103°14.8 |
| 8                | 1°06.1     | 5.8°                        | 22°54.9  | 10.3° | 59.8'            | 57°12.3   | 43°11.1     | 21°48.5    | 17°52.8 | 37°15.1 | 79°37.3    | 78°17.0 | 103°45.3 |
| 9                | 15°30.9    | 5.6°                        | 23°05.2  | 10.1° | 59.8'            | 56°38.5   | 42°40.1     | 21°17.1    | 17°20.0 | 37°50.0 | 80°10.9    | 78°34.5 | 104°15.7 |
| 10               | 29°55.5    | 5.5°                        | 23°15.3  | 10.0° | 59.9'            | 56°04.8   | 42°09.1     | 20°46.0    | 16°47.2 | 38°26.4 | 80°44.5    | 78°52.0 | 104°46.1 |
| 11               | 44°20.1    | 5.4°                        | 23°25.3  | 9.8°  | 59.9'            | 55°31.0   | 41°38.3     | 20°15.1    | 16°14.6 | 39°02.0 | 81°18.2    | 79°09.7 | 105°16.6 |
| 12               | 58°44.4    | 5.2°                        | N23°35.2 | 9.7°  | 59.9'            | 54°57.2   | 41°07.5     | 19°44.4    | 15°42.0 | 39°37.8 | 81°52.0    | 79°27.4 | 105°47.0 |
| 13               | 73°08.7    | 5.1°                        | 23°44.9  | 9.6°  | 59.9'            | 54°23.3   | 40°36.9     | 19°14.0    | 15°09.6 | 40°13.6 | 82°25.8    | 79°45.2 | 106°17.5 |
| 14               | 87°32.8    | 5.0°                        | 23°54.4  | 9.4°  | 60.0'            | 53°49.4   | 40°06.3     | 18°44.0    | 14°37.3 | 40°49.4 | 82°59.6    | 80°03.0 | 106°47.9 |
| 15               | 101°56.7   | 4.8°                        | 24°03.8  | 9.3°  | 60.0'            | 53°15.5   | 39°35.8     | 18°14.3    | 14°05.1 | 41°25.3 | 83°33.4    | 80°20.9 | 107°18.3 |
| 16               | 116°20.6   | 4.7°                        | 24°13.1  | 9.1°  | 60.0'            | 52°41.5   | 39°05.5     | 17°44.9    | 13°33.1 | 42°01.2 | 84°07.3    | 80°38.9 | 107°48.7 |
| 17               | 130°44.3   | 4.6°                        | 24°22.2  | 8.9°  | 60.1'            | 52°07.5   | 38°35.2     | 17°16.0    | 13°01.3 | 42°37.1 | 84°41.3    | 80°57.0 | 108°19.2 |
| 18               | 145°07.9   | 4.5°                        | N24°31.1 | 8.8°  | 60.1'            | 51°33.5   | 38°05.1     | 16°47.5    | 12°29.7 | 43°13.2 | 85°15.3    | 81°15.1 | 108°49.6 |
| 19               | 159°31.3   | 4.3°                        | 24°39.8  | 8.6°  | 60.1'            | 50°59.4   | 37°35.2     | 16°19.5    | 11°58.3 | 43°49.2 | 85°49.3    | 81°33.3 | 109°20.0 |
| 20               | 173°54.7   | 4.2°                        | 24°48.5  | 8.5°  | 60.1'            | 50°25.3   | 37°05.3     | 15°52.0    | 11°27.3 | 44°25.3 | 86°23.3    | 81°51.5 | 109°50.3 |
| 21               | 188°17.9   | 4.1°                        | 24°57.0  | 8.3°  | 60.2'            | 49°51.2   | 36°35.6     | 15°25.1    | 10°56.6 | 45°01.5 | 86°57.4    | 82°09.8 | 110°20.7 |
| 22               | 202°40.9   | 3.9°                        | 25°05.3  | 8.1°  | 60.2'            | 49°17.0   | 36°06.1     | 14°58.9    | 10°26.3 | 45°37.6 | 87°31.5    | 82°28.2 | 110°51.0 |
| 23               | 217°03.9   | 3.8°                        | 25°13.4  | 8.0°  | 60.2'            | 48°42.8   | 35°36.7     | 14°33.4    | 9°56.4  | 46°13.9 | 88°05.7    | 82°46.6 | 111°21.4 |
| 10 <sup>th</sup> | SD = 16.2' |                             |          |       | Mer. pass. 07:55 | Sun SD = 15.7'  |             |            |         |         |            |         |          |

| h   |     | Moon (13 <sup>th</sup> Jul) |     |   |  | Lunar Distance (objects with largest hourly LD delta) |  |  |  |  |  |  |  |
|-----|-----|-----------------------------|-----|---|--|---|--|--|--|--|--|--|--|
| Mon | GHA | $\nu$                       | Dec | d |  |   |  |  |  |  |  |  |  |