

Fri Feb 1, 2019 UTC

| UTC | Venus -4.1         |            | Jupiter -1.7      |            | Saturn +0.6       |            | Mars +0.9         |           |
|-----|--------------------|------------|-------------------|------------|-------------------|------------|-------------------|-----------|
|     | v = -0.6' d = 0.2' |            | v = 2.0' d = 0.0' |            | v = 2.2' d = 0.0' |            | v = 0.9' d = 0.7' |           |
|     | GHA                | dec        | GHA               | dec        | GHA               | dec        | GHA               | dec       |
| 0   | 224°28.8'          | S 20°48.9' | 234°08.6'         | S 22°15.3' | 204°43.9'         | S 22°08.9' | 111°43.2'         | N 8°25.5' |
| 1   | 239°28.2'          | S 20°49.1' | 249°10.6'         | S 22°15.4' | 219°46.1'         | S 22°08.8' | 126°44.1'         | N 8°26.2' |
| 2   | 254°27.7'          | S 20°49.3' | 264°12.6'         | S 22°15.4' | 234°48.3'         | S 22°08.8' | 141°44.9'         | N 8°26.8' |
| 3   | 269°27.1'          | S 20°49.5' | 279°14.6'         | S 22°15.4' | 249°50.4'         | S 22°08.8' | 156°45.8'         | N 8°27.5' |
| 4   | 284°26.5'          | S 20°49.7' | 294°16.6'         | S 22°15.5' | 264°52.6'         | S 22°08.8' | 171°46.7'         | N 8°28.2' |
| 5   | 299°26.0'          | S 20°49.9' | 309°18.6'         | S 22°15.5' | 279°54.8'         | S 22°08.7' | 186°47.6'         | N 8°28.8' |
| 6   | 314°25.4'          | S 20°50.1' | 324°20.6'         | S 22°15.6' | 294°56.9'         | S 22°08.7' | 201°48.5'         | N 8°29.5' |
| 7   | 329°24.9'          | S 20°50.3' | 339°22.6'         | S 22°15.6' | 309°59.1'         | S 22°08.7' | 216°49.4'         | N 8°30.2' |
| 8   | 344°24.3'          | S 20°50.5' | 354°24.6'         | S 22°15.6' | 325°01.3'         | S 22°08.6' | 231°50.3'         | N 8°30.9' |
| 9   | 359°23.7'          | S 20°50.7' | 9°26.6'           | S 22°15.7' | 340°03.4'         | S 22°08.6' | 246°51.2'         | N 8°31.5' |
| 10  | 14°23.2'           | S 20°50.9' | 24°28.6'          | S 22°15.7' | 355°05.6'         | S 22°08.6' | 261°52.1'         | N 8°32.2' |
| 11  | 29°22.6'           | S 20°51.1' | 39°30.6'          | S 22°15.7' | 10°07.8'          | S 22°08.6' | 276°53.0'         | N 8°32.9' |
| 12  | 44°22.1'           | S 20°51.3' | 54°32.6'          | S 22°15.8' | 25°10.0'          | S 22°08.5' | 291°53.9'         | N 8°33.5' |
| 13  | 59°21.5'           | S 20°51.5' | 69°34.6'          | S 22°15.8' | 40°12.1'          | S 22°08.5' | 306°54.8'         | N 8°34.2' |
| 14  | 74°20.9'           | S 20°51.7' | 84°36.6'          | S 22°15.9' | 55°14.3'          | S 22°08.5' | 321°55.6'         | N 8°34.9' |
| 15  | 89°20.4'           | S 20°51.9' | 99°38.6'          | S 22°15.9' | 70°16.5'          | S 22°08.4' | 336°56.5'         | N 8°35.5' |
| 16  | 104°19.8'          | S 20°52.1' | 114°40.6'         | S 22°15.9' | 85°18.6'          | S 22°08.4' | 351°57.4'         | N 8°36.2' |
| 17  | 119°19.2'          | S 20°52.3' | 129°42.6'         | S 22°16.0' | 100°20.8'         | S 22°08.4' | 6°58.3'           | N 8°36.9' |
| 18  | 134°18.7'          | S 20°52.5' | 144°44.6'         | S 22°16.0' | 115°23.0'         | S 22°08.4' | 21°59.2'          | N 8°37.6' |
| 19  | 149°18.1'          | S 20°52.7' | 159°46.6'         | S 22°16.1' | 130°25.1'         | S 22°08.3' | 37°00.1'          | N 8°38.2' |
| 20  | 164°17.5'          | S 20°52.8' | 174°48.6'         | S 22°16.1' | 145°27.3'         | S 22°08.3' | 52°01.0'          | N 8°38.9' |
| 21  | 179°17.0'          | S 20°53.0' | 189°50.6'         | S 22°16.1' | 160°29.5'         | S 22°08.3' | 67°01.9'          | N 8°39.6' |
| 22  | 194°16.4'          | S 20°53.2' | 204°52.6'         | S 22°16.2' | 175°31.7'         | S 22°08.3' | 82°02.8'          | N 8°40.2' |
| 23  | 209°15.8'          | S 20°53.4' | 219°54.6'         | S 22°16.2' | 190°33.8'         | S 22°08.2' | 97°03.7'          | N 8°40.9' |

Sat Feb 2, 2019 UTC

| UTC | Venus -4.1         |            | Jupiter -1.7      |            | Saturn +0.6       |            | Mars +0.9         |           |
|-----|--------------------|------------|-------------------|------------|-------------------|------------|-------------------|-----------|
|     | v = -0.6' d = 0.2' |            | v = 2.0' d = 0.0' |            | v = 2.2' d = 0.0' |            | v = 0.9' d = 0.7' |           |
|     | GHA                | dec        | GHA               | dec        | GHA               | dec        | GHA               | dec       |
| 0   | 224°15.3'          | S 20°53.6' | 234°56.6'         | S 22°16.3' | 205°36.0'         | S 22°08.2' | 112°04.5'         | N 8°41.6' |
| 1   | 239°14.7'          | S 20°53.8' | 249°58.6'         | S 22°16.3' | 220°38.2'         | S 22°08.2' | 127°05.4'         | N 8°42.2' |
| 2   | 254°14.1'          | S 20°53.9' | 265°00.6'         | S 22°16.3' | 235°40.3'         | S 22°08.1' | 142°06.3'         | N 8°42.9' |
| 3   | 269°13.6'          | S 20°54.1' | 280°02.6'         | S 22°16.4' | 250°42.5'         | S 22°08.1' | 157°07.2'         | N 8°43.6' |
| 4   | 284°13.0'          | S 20°54.3' | 295°04.6'         | S 22°16.4' | 265°44.7'         | S 22°08.1' | 172°08.1'         | N 8°44.3' |
| 5   | 299°12.4'          | S 20°54.5' | 310°06.6'         | S 22°16.4' | 280°46.9'         | S 22°08.1' | 187°09.0'         | N 8°44.9' |
| 6   | 314°11.8'          | S 20°54.7' | 325°08.6'         | S 22°16.5' | 295°49.0'         | S 22°08.0' | 202°09.9'         | N 8°45.6' |
| 7   | 329°11.3'          | S 20°54.8' | 340°10.7'         | S 22°16.5' | 310°51.2'         | S 22°08.0' | 217°10.8'         | N 8°46.3' |
| 8   | 344°10.7'          | S 20°55.0' | 355°12.7'         | S 22°16.6' | 325°53.4'         | S 22°08.0' | 232°11.7'         | N 8°46.9' |
| 9   | 359°10.1'          | S 20°55.2' | 10°14.7'          | S 22°16.6' | 340°55.5'         | S 22°07.9' | 247°12.6'         | N 8°47.6' |
| 10  | 14°09.6'           | S 20°55.4' | 25°16.7'          | S 22°16.6' | 355°57.7'         | S 22°07.9' | 262°13.4'         | N 8°48.3' |
| 11  | 29°09.0'           | S 20°55.5' | 40°18.7'          | S 22°16.7' | 10°59.9'          | S 22°07.9' | 277°14.3'         | N 8°48.9' |
| 12  | 44°08.4'           | S 20°55.7' | 55°20.7'          | S 22°16.7' | 26°02.1'          | S 22°07.9' | 292°15.2'         | N 8°49.6' |
| 13  | 59°07.8'           | S 20°55.9' | 70°22.7'          | S 22°16.8' | 41°04.2'          | S 22°07.8' | 307°16.1'         | N 8°50.3' |
| 14  | 74°07.3'           | S 20°56.1' | 85°24.7'          | S 22°16.8' | 56°06.4'          | S 22°07.8' | 322°17.0'         | N 8°50.9' |
| 15  | 89°06.7'           | S 20°56.2' | 100°26.7'         | S 22°16.8' | 71°08.6'          | S 22°07.8' | 337°17.9'         | N 8°51.6' |
| 16  | 104°06.1'          | S 20°56.4' | 115°28.7'         | S 22°16.9' | 86°10.7'          | S 22°07.7' | 352°18.8'         | N 8°52.3' |
| 17  | 119°05.5'          | S 20°56.6' | 130°30.7'         | S 22°16.9' | 101°12.9'         | S 22°07.7' | 7°19.7'           | N 8°52.9' |
| 18  | 134°05.0'          | S 20°56.7' | 145°32.7'         | S 22°16.9' | 116°15.1'         | S 22°07.7' | 22°20.6'          | N 8°53.6' |
| 19  | 149°04.4'          | S 20°56.9' | 160°34.7'         | S 22°17.0' | 131°17.3'         | S 22°07.7' | 37°21.4'          | N 8°54.3' |
| 20  | 164°03.8'          | S 20°57.1' | 175°36.7'         | S 22°17.0' | 146°19.4'         | S 22°07.6' | 52°22.3'          | N 8°54.9' |
| 21  | 179°03.2'          | S 20°57.2' | 190°38.7'         | S 22°17.1' | 161°21.6'         | S 22°07.6' | 67°23.2'          | N 8°55.6' |
| 22  | 194°02.7'          | S 20°57.4' | 205°40.7'         | S 22°17.1' | 176°23.8'         | S 22°07.6' | 82°24.1'          | N 8°56.3' |
| 23  | 209°02.1'          | S 20°57.6' | 220°42.8'         | S 22°17.1' | 191°26.0'         | S 22°07.5' | 97°25.0'          | N 8°56.9' |

Sun Feb 3, 2019 UTC

| UTC | Venus -4.1         |            | Jupiter -1.7      |            | Saturn +0.6       |            | Mars +0.9         |           |
|-----|--------------------|------------|-------------------|------------|-------------------|------------|-------------------|-----------|
|     | v = -0.6' d = 0.2' |            | v = 2.0' d = 0.0' |            | v = 2.2' d = 0.0' |            | v = 0.9' d = 0.7' |           |
|     | GHA                | dec        | GHA               | dec        | GHA               | dec        | GHA               | dec       |
| 0   | 224°01.5'          | S 20°57.7' | 235°44.8'         | S 22°17.2' | 206°28.1'         | S 22°07.5' | 112°25.9'         | N 8°57.6' |
| 1   | 239°00.9'          | S 20°57.9' | 250°46.8'         | S 22°17.2' | 221°30.3'         | S 22°07.5' | 127°26.8'         | N 8°58.3' |
| 2   | 254°00.4'          | S 20°58.0' | 265°48.8'         | S 22°17.2' | 236°32.5'         | S 22°07.5' | 142°27.7'         | N 8°58.9' |
| 3   | 268°59.8'          | S 20°58.2' | 280°50.8'         | S 22°17.3' | 251°34.6'         | S 22°07.4' | 157°28.5'         | N 8°59.6' |
| 4   | 283°59.2'          | S 20°58.4' | 295°52.8'         | S 22°17.3' | 266°36.8'         | S 22°07.4' | 172°29.4'         | N 9°00.3' |
| 5   | 298°58.6'          | S 20°58.5' | 310°54.8'         | S 22°17.4' | 281°39.0'         | S 22°07.4' | 187°30.3'         | N 9°00.9' |
| 6   | 313°58.0'          | S 20°58.7' | 325°56.8'         | S 22°17.4' | 296°41.2'         | S 22°07.3' | 202°31.2'         | N 9°01.6' |
| 7   | 328°57.5'          | S 20°58.8' | 340°58.8'         | S 22°17.4' | 311°43.3'         | S 22°07.3' | 217°32.1'         | N 9°02.3' |
| 8   | 343°56.9'          | S 20°59.0' | 356°00.8'         | S 22°17.5' | 326°45.5'         | S 22°07.3' | 232°33.0'         | N 9°02.9' |
| 9   | 358°56.3'          | S 20°59.1' | 11°02.8'          | S 22°17.5' | 341°47.7'         | S 22°07.3' | 247°33.9'         | N 9°03.6' |
| 10  | 13°55.7'           | S 20°59.3' | 26°04.8'          | S 22°17.5' | 356°49.9'         | S 22°07.2' | 262°34.8'         | N 9°04.3' |
| 11  | 28°55.1'           | S 20°59.4' | 41°06.9'          | S 22°17.6' | 11°52.0'          | S 22°07.2' | 277°35.6'         | N 9°04.9' |
| 12  | 43°54.5'           | S 20°59.6' | 56°08.9'          | S 22°17.6' | 26°54.2'          | S 22°07.2' | 292°36.5'         | N 9°05.6' |
| 13  | 58°54.0'           | S 20°59.7' | 71°10.9'          | S 22°17.7' | 41°56.4'          | S 22°07.1' | 307°37.4'         | N 9°06.2' |
| 14  | 73°53.4'           | S 20°59.9' | 86°12.9'          | S 22°17.7' | 56°58.5'          | S 22°07.1' | 322°38.3'         | N 9°06.9' |
| 15  | 88°52.8'           | S 21°00.0' | 101°14.9'         | S 22°17.7' | 72°00.7'          | S 22°07.1' | 337°39.2'         | N 9°07.6' |
| 16  | 103°52.2'          | S 21°00.2' | 116°16.9'         | S 22°17.8' | 87°02.9'          | S 22°07.1' | 352°40.1'         | N 9°08.2' |
| 17  | 118°51.6'          | S 21°00.3' | 131°18.9'         | S 22°17.8' | 102°05.1'         | S 22°07.0' | 7°41.0'           | N 9°08.9' |
| 18  | 133°51.0'          | S 21°00.5' | 146°20.9'         | S 22°17.8' | 117°07.2'         | S 22°07.0' | 22°41.8'          | N 9°09.6' |
| 19  | 148°50.5'          | S 21°00.6' | 161°22.9'         | S 22°17.9' | 132°09.4'         | S 22°07.0' | 37°42.7'          | N 9°10.2' |
| 20  | 163°49.9'          | S 21°00.8' | 176°25.0'         | S 22°17.9' | 147°11.6'         | S 22°06.9' | 52°43.6'          | N 9°10.9' |
| 21  | 178°49.3'          | S 21°00.9' | 191°27.0'         | S 22°17.9' | 162°13.8'         | S 22°06.9' | 67°44.5'          | N 9°11.6' |
| 22  | 193°48.7'          | S 21°01.1' | 206°29.0'         | S 22°18.0' | 177°15.9'         | S 22°06.9' | 82°45.4'          | N 9°12.2' |
| 23  | 208°48.1'          | S 21°01.2' | 221°31.0'         | S 22°18.0' | 192°18.1'         | S 22°06.9' | 97°46.3'          | N 9°12.9' |

Mon Feb 4, 2019 UTC

| UTC | Venus -4.1         |            | Jupiter -1.8      |            | Saturn +0.6       |            | Mars +0.9         |           |
|-----|--------------------|------------|-------------------|------------|-------------------|------------|-------------------|-----------|
|     | v = -0.6' d = 0.1' |            | v = 2.0' d = 0.0' |            | v = 2.2' d = 0.0' |            | v = 0.9' d = 0.7' |           |
|     | GHA                | dec        | GHA               | dec        | GHA               | dec        | GHA               | dec       |
| 0   | 223°47.5'          | S 21°01.3' | 236°33.0'         | S 22°18.1' | 207°20.3'         | S 22°06.8' | 112°47.2'         | N 9°13.5' |
| 1   | 238°46.9'          | S 21°01.5' | 251°35.0'         | S 22°18.1' | 222°22.5'         | S 22°06.8' | 127°48.0'         | N 9°14.2' |
| 2   | 253°46.3'          | S 21°01.6' | 266°37.0'         | S 22°18.1' | 237°24.6'         | S 22°06.8' | 142°48.9'         | N 9°14.9' |
| 3   | 268°45.8'          | S 21°01.8' | 281°39.0'         | S 22°18.2' | 252°26.8'         | S 22°06.7' | 157°49.8'         | N 9°15.5' |
| 4   | 283°45.2'          | S 21°01.9' | 296°41.0'         | S 22°18.2' | 267°29.0'         | S 22°06.7' | 172°50.7'         | N 9°16.2' |
| 5   | 298°44.6'          | S 21°02.0' | 311°43.1'         | S 22°18.2' | 282°31.2'         | S 22°06.7' | 187°51.6'         | N 9°16.9' |
| 6   | 313°44.0'          | S 21°02.2' | 326°45.1'         | S 22°18.3' | 297°33.3'         | S 22°06.7' | 202°52.5'         | N 9°17.5' |
| 7   | 328°43.4'          | S 21°02.3' | 341°47.1'         | S 22°18.3' | 312°35.5'         | S 22°06.6' | 217°53.3'         | N 9°18.2' |
| 8   | 343°42.8'          | S 21°02.4' | 356°49.1'         | S 22°18.3' | 327°37.7'         | S 22°06.6' | 232°54.2'         | N 9°18.8' |
| 9   | 358°42.2'          | S 21°02.6' | 11°51.1'          | S 22°18.4' | 342°39.9'         | S 22°06.6' | 247°55.1'         | N 9°19.5' |
| 10  | 13°41.6'           | S 21°02.7' | 26°53.1'          | S 22°18.4' | 357°42.0'         | S 22°06.5' | 262°56.0'         | N 9°20.2' |
| 11  | 28°41.0'           | S 21°02.8' | 41°55.1'          | S 22°18.5' | 12°44.2'          | S 22°06.5' | 277°56.9'         | N 9°20.8' |
| 12  | 43°40.4'           | S 21°02.9' | 56°57.2'          | S 22°18.5' | 27°46.4'          | S 22°06.5' | 292°57.8'         | N 9°21.5' |
| 13  | 58°39.9'           | S 21°03.1' | 71°59.2'          | S 22°18.5' | 42°48.6'          | S 22°06.5' | 307°58.7'         | N 9°22.2' |
| 14  | 73°39.3'           | S 21°03.2' | 87°01.2'          | S 22°18.6' | 57°50.7'          | S 22°06.4' | 322°59.5'         | N 9°22.8' |
| 15  | 88°38.7'           | S 21°03.3' | 102°03.2'         | S 22°18.6' | 72°52.9'          | S 22°06.4' | 338°00.4'         | N 9°23.5' |
| 16  | 103°38.1'          | S 21°03.5' | 117°05.2'         | S 22°18.6' | 87°55.1'          | S 22°06.4' | 353°01.3'         | N 9°24.1' |
| 17  | 118°37.5'          | S 21°03.6' | 132°07.2'         | S 22°18.7' | 102°57.3'         | S 22°06.4' | 8°02.2'           | N 9°24.8' |
| 18  | 133°36.9'          | S 21°03.7' | 147°09.2'         | S 22°18.7' | 117°59.4'         | S 22°06.3' | 23°03.1'          | N 9°25.5' |
| 19  | 148°36.3'          | S 21°03.8' | 162°11.3'         | S 22°18.7' | 133°01.6'         | S 22°06.3' | 38°04.0'          | N 9°26.1' |
| 20  | 163°35.7'          | S 21°03.9' | 177°13.3'         | S 22°18.8' | 148°03.8'         | S 22°06.3' | 53°04.8'          | N 9°26.8' |
| 21  | 178°35.1'          | S 21°04.1' | 192°15.3'         | S 22°18.8' | 163°06.0'         | S 22°06.2' | 68°05.7'          | N 9°27.4' |
| 22  | 193°34.5'          | S 21°04.2' | 207°17.3'         | S 22°18.9' | 178°08.1'         | S 22°06.2' | 83°06.6'          | N 9°28.1' |
| 23  | 208°33.9'          | S 21°04.3' | 222°19.3'         | S 22°18.9' | 193°10.3'         | S 22°06.2' | 98°07.5'          | N 9°28.8' |

Tue Feb 5, 2019 UTC

| UTC | Venus -4.1<br>v = -0.6' d = 0.1' |            | Jupiter -1.8<br>v = 2.0' d = 0.0' |            | Saturn +0.6<br>v = 2.2' d = 0.0' |            | Mars +0.9<br>v = 0.9' d = 0.7' |           |
|-----|----------------------------------|------------|-----------------------------------|------------|----------------------------------|------------|--------------------------------|-----------|
|     | GHA                              | dec        | GHA                               | dec        | GHA                              | dec        | GHA                            | dec       |
| 0   | 223°33.3'                        | S 21°04.4' | 237°21.3'                         | S 22°18.9' | 208°12.5'                        | S 22°06.2' | 113°08.4'                      | N 9°29.4' |
| 1   | 238°32.7'                        | S 21°04.5' | 252°23.4'                         | S 22°19.0' | 223°14.7'                        | S 22°06.1' | 128°09.3'                      | N 9°30.1' |
| 2   | 253°32.1'                        | S 21°04.7' | 267°25.4'                         | S 22°19.0' | 238°16.8'                        | S 22°06.1' | 143°10.1'                      | N 9°30.7' |
| 3   | 268°31.5'                        | S 21°04.8' | 282°27.4'                         | S 22°19.0' | 253°19.0'                        | S 22°06.1' | 158°11.0'                      | N 9°31.4' |
| 4   | 283°30.9'                        | S 21°04.9' | 297°29.4'                         | S 22°19.1' | 268°21.2'                        | S 22°06.0' | 173°11.9'                      | N 9°32.1' |
| 5   | 298°30.3'                        | S 21°05.0' | 312°31.4'                         | S 22°19.1' | 283°23.4'                        | S 22°06.0' | 188°12.8'                      | N 9°32.7' |
| 6   | 313°29.7'                        | S 21°05.1' | 327°33.4'                         | S 22°19.1' | 298°25.6'                        | S 22°06.0' | 203°13.7'                      | N 9°33.4' |
| 7   | 328°29.1'                        | S 21°05.2' | 342°35.5'                         | S 22°19.2' | 313°27.7'                        | S 22°06.0' | 218°14.5'                      | N 9°34.0' |
| 8   | 343°28.5'                        | S 21°05.3' | 357°37.5'                         | S 22°19.2' | 328°29.9'                        | S 22°05.9' | 233°15.4'                      | N 9°34.7' |
| 9   | 358°27.9'                        | S 21°05.5' | 12°39.5'                          | S 22°19.2' | 343°32.1'                        | S 22°05.9' | 248°16.3'                      | N 9°35.4' |
| 10  | 13°27.3'                         | S 21°05.6' | 27°41.5'                          | S 22°19.3' | 358°34.3'                        | S 22°05.9' | 263°17.2'                      | N 9°36.0' |
| 11  | 28°26.7'                         | S 21°05.7' | 42°43.5'                          | S 22°19.3' | 13°36.4'                         | S 22°05.8' | 278°18.1'                      | N 9°36.7' |
| 12  | 43°26.1'                         | S 21°05.8' | 57°45.6'                          | S 22°19.4' | 28°38.6'                         | S 22°05.8' | 293°19.0'                      | N 9°37.3' |
| 13  | 58°25.5'                         | S 21°05.9' | 72°47.6'                          | S 22°19.4' | 43°40.8'                         | S 22°05.8' | 308°19.8'                      | N 9°38.0' |
| 14  | 73°24.9'                         | S 21°06.0' | 87°49.6'                          | S 22°19.4' | 58°43.0'                         | S 22°05.8' | 323°20.7'                      | N 9°38.6' |
| 15  | 88°24.3'                         | S 21°06.1' | 102°51.6'                         | S 22°19.5' | 73°45.1'                         | S 22°05.7' | 338°21.6'                      | N 9°39.3' |
| 16  | 103°23.7'                        | S 21°06.2' | 117°53.6'                         | S 22°19.5' | 88°47.3'                         | S 22°05.7' | 353°22.5'                      | N 9°40.0' |
| 17  | 118°23.1'                        | S 21°06.3' | 132°55.7'                         | S 22°19.5' | 103°49.5'                        | S 22°05.7' | 8°23.4'                        | N 9°40.6' |
| 18  | 133°22.5'                        | S 21°06.4' | 147°57.7'                         | S 22°19.6' | 118°51.7'                        | S 22°05.6' | 23°24.2'                       | N 9°41.3' |
| 19  | 148°21.9'                        | S 21°06.5' | 162°59.7'                         | S 22°19.6' | 133°53.9'                        | S 22°05.6' | 38°25.1'                       | N 9°41.9' |
| 20  | 163°21.3'                        | S 21°06.6' | 178°01.7'                         | S 22°19.6' | 148°56.0'                        | S 22°05.6' | 53°26.0'                       | N 9°42.6' |
| 21  | 178°20.7'                        | S 21°06.7' | 193°03.7'                         | S 22°19.7' | 163°58.2'                        | S 22°05.6' | 68°26.9'                       | N 9°43.2' |
| 22  | 193°20.1'                        | S 21°06.8' | 208°05.8'                         | S 22°19.7' | 179°00.4'                        | S 22°05.5' | 83°27.8'                       | N 9°43.9' |
| 23  | 208°19.5'                        | S 21°06.9' | 223°07.8'                         | S 22°19.7' | 194°02.6'                        | S 22°05.5' | 98°28.6'                       | N 9°44.6' |

Wed Feb 6, 2019 UTC

| UTC | Venus -4.1<br>v = -0.6' d = 0.1' |            | Jupiter -1.8<br>v = 2.0' d = 0.0' |            | Saturn +0.6<br>v = 2.2' d = 0.0' |            | Mars +0.9<br>v = 0.9' d = 0.7' |            |
|-----|----------------------------------|------------|-----------------------------------|------------|----------------------------------|------------|--------------------------------|------------|
|     | GHA                              | dec        | GHA                               | dec        | GHA                              | dec        | GHA                            | dec        |
| 0   | 223°18.9'                        | S 21°07.0' | 238°09.8'                         | S 22°19.8' | 209°04.7'                        | S 22°05.5' | 113°29.5'                      | N 9°45.2'  |
| 1   | 238°18.3'                        | S 21°07.1' | 253°11.8'                         | S 22°19.8' | 224°06.9'                        | S 22°05.4' | 128°30.4'                      | N 9°45.9'  |
| 2   | 253°17.7'                        | S 21°07.2' | 268°13.8'                         | S 22°19.8' | 239°09.1'                        | S 22°05.4' | 143°31.3'                      | N 9°46.5'  |
| 3   | 268°17.1'                        | S 21°07.3' | 283°15.9'                         | S 22°19.9' | 254°11.3'                        | S 22°05.4' | 158°32.2'                      | N 9°47.2'  |
| 4   | 283°16.5'                        | S 21°07.4' | 298°17.9'                         | S 22°19.9' | 269°13.5'                        | S 22°05.4' | 173°33.0'                      | N 9°47.8'  |
| 5   | 298°15.9'                        | S 21°07.5' | 313°19.9'                         | S 22°19.9' | 284°15.6'                        | S 22°05.3' | 188°33.9'                      | N 9°48.5'  |
| 6   | 313°15.3'                        | S 21°07.5' | 328°21.9'                         | S 22°20.0' | 299°17.8'                        | S 22°05.3' | 203°34.8'                      | N 9°49.2'  |
| 7   | 328°14.7'                        | S 21°07.6' | 343°24.0'                         | S 22°20.0' | 314°20.0'                        | S 22°05.3' | 218°35.7'                      | N 9°49.8'  |
| 8   | 343°14.1'                        | S 21°07.7' | 358°26.0'                         | S 22°20.1' | 329°22.2'                        | S 22°05.2' | 233°36.6'                      | N 9°50.5'  |
| 9   | 358°13.5'                        | S 21°07.8' | 13°28.0'                          | S 22°20.1' | 344°24.3'                        | S 22°05.2' | 248°37.4'                      | N 9°51.1'  |
| 10  | 13°12.8'                         | S 21°07.9' | 28°30.0'                          | S 22°20.1' | 359°26.5'                        | S 22°05.2' | 263°38.3'                      | N 9°51.8'  |
| 11  | 28°12.2'                         | S 21°08.0' | 43°32.0'                          | S 22°20.2' | 14°28.7'                         | S 22°05.2' | 278°39.2'                      | N 9°52.4'  |
| 12  | 43°11.6'                         | S 21°08.1' | 58°34.1'                          | S 22°20.2' | 29°30.9'                         | S 22°05.1' | 293°40.1'                      | N 9°53.1'  |
| 13  | 58°11.0'                         | S 21°08.2' | 73°36.1'                          | S 22°20.2' | 44°33.1'                         | S 22°05.1' | 308°41.0'                      | N 9°53.7'  |
| 14  | 73°10.4'                         | S 21°08.2' | 88°38.1'                          | S 22°20.3' | 59°35.2'                         | S 22°05.1' | 323°41.8'                      | N 9°54.4'  |
| 15  | 88°09.8'                         | S 21°08.3' | 103°40.1'                         | S 22°20.3' | 74°37.4'                         | S 22°05.0' | 338°42.7'                      | N 9°55.1'  |
| 16  | 103°09.2'                        | S 21°08.4' | 118°42.2'                         | S 22°20.3' | 89°39.6'                         | S 22°05.0' | 353°43.6'                      | N 9°55.7'  |
| 17  | 118°08.6'                        | S 21°08.5' | 133°44.2'                         | S 22°20.4' | 104°41.8'                        | S 22°05.0' | 8°44.5'                        | N 9°56.4'  |
| 18  | 133°08.0'                        | S 21°08.6' | 148°46.2'                         | S 22°20.4' | 119°44.0'                        | S 22°05.0' | 23°45.4'                       | N 9°57.0'  |
| 19  | 148°07.4'                        | S 21°08.6' | 163°48.2'                         | S 22°20.4' | 134°46.1'                        | S 22°04.9' | 38°46.2'                       | N 9°57.7'  |
| 20  | 163°06.8'                        | S 21°08.7' | 178°50.3'                         | S 22°20.5' | 149°48.3'                        | S 22°04.9' | 53°47.1'                       | N 9°58.3'  |
| 21  | 178°06.1'                        | S 21°08.8' | 193°52.3'                         | S 22°20.5' | 164°50.5'                        | S 22°04.9' | 68°48.0'                       | N 9°59.0'  |
| 22  | 193°05.5'                        | S 21°08.9' | 208°54.3'                         | S 22°20.5' | 179°52.7'                        | S 22°04.8' | 83°48.9'                       | N 9°59.6'  |
| 23  | 208°04.9'                        | S 21°08.9' | 223°56.3'                         | S 22°20.6' | 194°54.9'                        | S 22°04.8' | 98°49.8'                       | N 10°00.3' |

Thu Feb 7, 2019 UTC

| UTC | Venus -4.1<br>v = -0.6' d = 0.1' |            | Jupiter -1.8<br>v = 2.0' d = 0.0' |            | Saturn +0.6<br>v = 2.2' d = 0.0' |            | Mars +1.0<br>v = 0.9' d = 0.7' |            |
|-----|----------------------------------|------------|-----------------------------------|------------|----------------------------------|------------|--------------------------------|------------|
|     | GHA                              | dec        | GHA                               | dec        | GHA                              | dec        | GHA                            | dec        |
| 0   | 223°04.3'                        | S 21°09.0' | 238°58.4'                         | S 22°20.6' | 209°57.0'                        | S 22°04.8' | 113°50.6'                      | N 10°00.9' |
| 1   | 238°03.7'                        | S 21°09.1' | 254°00.4'                         | S 22°20.6' | 224°59.2'                        | S 22°04.8' | 128°51.5'                      | N 10°01.6' |
| 2   | 253°03.1'                        | S 21°09.2' | 269°02.4'                         | S 22°20.7' | 240°01.4'                        | S 22°04.7' | 143°52.4'                      | N 10°02.2' |
| 3   | 268°02.5'                        | S 21°09.2' | 284°04.4'                         | S 22°20.7' | 255°03.6'                        | S 22°04.7' | 158°53.3'                      | N 10°02.9' |
| 4   | 283°01.9'                        | S 21°09.3' | 299°06.5'                         | S 22°20.7' | 270°05.8'                        | S 22°04.7' | 173°54.1'                      | N 10°03.5' |
| 5   | 298°01.2'                        | S 21°09.4' | 314°08.5'                         | S 22°20.8' | 285°07.9'                        | S 22°04.6' | 188°55.0'                      | N 10°04.2' |
| 6   | 313°00.6'                        | S 21°09.4' | 329°10.5'                         | S 22°20.8' | 300°10.1'                        | S 22°04.6' | 203°55.9'                      | N 10°04.9' |
| 7   | 328°00.0'                        | S 21°09.5' | 344°12.6'                         | S 22°20.8' | 315°12.3'                        | S 22°04.6' | 218°56.8'                      | N 10°05.5' |
| 8   | 342°59.4'                        | S 21°09.6' | 359°14.6'                         | S 22°20.9' | 330°14.5'                        | S 22°04.6' | 233°57.6'                      | N 10°06.2' |
| 9   | 357°58.8'                        | S 21°09.6' | 14°16.6'                          | S 22°20.9' | 345°16.7'                        | S 22°04.5' | 248°58.5'                      | N 10°06.8' |
| 10  | 12°58.2'                         | S 21°09.7' | 29°18.6'                          | S 22°20.9' | 0°18.8'                          | S 22°04.5' | 263°59.4'                      | N 10°07.5' |
| 11  | 27°57.6'                         | S 21°09.8' | 44°20.7'                          | S 22°21.0' | 15°21.0'                         | S 22°04.5' | 279°00.3'                      | N 10°08.1' |
| 12  | 42°56.9'                         | S 21°09.8' | 59°22.7'                          | S 22°21.0' | 30°23.2'                         | S 22°04.4' | 294°01.2'                      | N 10°08.8' |
| 13  | 57°56.3'                         | S 21°09.9' | 74°24.7'                          | S 22°21.0' | 45°25.4'                         | S 22°04.4' | 309°02.0'                      | N 10°09.4' |
| 14  | 72°55.7'                         | S 21°09.9' | 89°26.8'                          | S 22°21.1' | 60°27.6'                         | S 22°04.4' | 324°02.9'                      | N 10°10.1' |
| 15  | 87°55.1'                         | S 21°10.0' | 104°28.8'                         | S 22°21.1' | 75°29.7'                         | S 22°04.4' | 339°03.8'                      | N 10°10.7' |
| 16  | 102°54.5'                        | S 21°10.1' | 119°30.8'                         | S 22°21.1' | 90°31.9'                         | S 22°04.3' | 354°04.7'                      | N 10°11.4' |
| 17  | 117°53.9'                        | S 21°10.1' | 134°32.8'                         | S 22°21.2' | 105°34.1'                        | S 22°04.3' | 9°05.5'                        | N 10°12.0' |
| 18  | 132°53.2'                        | S 21°10.2' | 149°34.9'                         | S 22°21.2' | 120°36.3'                        | S 22°04.3' | 24°06.4'                       | N 10°12.7' |
| 19  | 147°52.6'                        | S 21°10.2' | 164°36.9'                         | S 22°21.2' | 135°38.5'                        | S 22°04.2' | 39°07.3'                       | N 10°13.3' |
| 20  | 162°52.0'                        | S 21°10.3' | 179°38.9'                         | S 22°21.3' | 150°40.6'                        | S 22°04.2' | 54°08.2'                       | N 10°14.0' |
| 21  | 177°51.4'                        | S 21°10.3' | 194°41.0'                         | S 22°21.3' | 165°42.8'                        | S 22°04.2' | 69°09.0'                       | N 10°14.6' |
| 22  | 192°50.8'                        | S 21°10.4' | 209°43.0'                         | S 22°21.3' | 180°45.0'                        | S 22°04.2' | 84°09.9'                       | N 10°15.3' |
| 23  | 207°50.2'                        | S 21°10.4' | 224°45.0'                         | S 22°21.4' | 195°47.2'                        | S 22°04.1' | 99°10.8'                       | N 10°15.9' |

Fri Feb 8, 2019 UTC

| UTC | Venus -4.1<br>v = -0.6' d = 0.0' |            | Jupiter -1.8<br>v = 2.0' d = 0.0' |            | Saturn +0.6<br>v = 2.2' d = 0.0' |            | Mars +1.0<br>v = 0.9' d = 0.6' |            |
|-----|----------------------------------|------------|-----------------------------------|------------|----------------------------------|------------|--------------------------------|------------|
|     | GHA                              | dec        | GHA                               | dec        | GHA                              | dec        | GHA                            | dec        |
| 0   | 222°49.5'                        | S 21°10.5' | 239°47.1'                         | S 22°21.4' | 210°49.4'                        | S 22°04.1' | 114°11.7'                      | N 10°16.6' |
| 1   | 237°48.9'                        | S 21°10.5' | 254°49.1'                         | S 22°21.4' | 225°51.6'                        | S 22°04.1' | 129°12.5'                      | N 10°17.2' |
| 2   | 252°48.3'                        | S 21°10.6' | 269°51.1'                         | S 22°21.5' | 240°53.7'                        | S 22°04.0' | 144°13.4'                      | N 10°17.9' |
| 3   | 267°47.7'                        | S 21°10.6' | 284°53.1'                         | S 22°21.5' | 255°55.9'                        | S 22°04.0' | 159°14.3'                      | N 10°18.5' |
| 4   | 282°47.1'                        | S 21°10.7' | 299°55.2'                         | S 22°21.5' | 270°58.1'                        | S 22°04.0' | 174°15.2'                      | N 10°19.2' |
| 5   | 297°46.4'                        | S 21°10.7' | 314°57.2'                         | S 22°21.6' | 286°00.3'                        | S 22°04.0' | 189°16.0'                      | N 10°19.8' |
| 6   | 312°45.8'                        | S 21°10.8' | 329°59.2'                         | S 22°21.6' | 301°02.5'                        | S 22°03.9' | 204°16.9'                      | N 10°20.5' |
| 7   | 327°45.2'                        | S 21°10.8' | 345°01.3'                         | S 22°21.6' | 316°04.6'                        | S 22°03.9' | 219°17.8'                      | N 10°21.1' |
| 8   | 342°44.6'                        | S 21°10.9' | 0°03.3'                           | S 22°21.7' | 331°06.8'                        | S 22°03.9' | 234°18.7'                      | N 10°21.8' |
| 9   | 357°44.0'                        | S 21°10.9' | 15°05.3'                          | S 22°21.7' | 346°09.0'                        | S 22°03.8' | 249°19.5'                      | N 10°22.4' |
| 10  | 12°43.3'                         | S 21°10.9' | 30°07.4'                          | S 22°21.7' | 1°11.2'                          | S 22°03.8' | 264°20.4'                      | N 10°23.1' |
| 11  | 27°42.7'                         | S 21°11.0' | 45°09.4'                          | S 22°21.8' | 16°13.4'                         | S 22°03.8' | 279°21.3'                      | N 10°23.7' |
| 12  | 42°42.1'                         | S 21°11.0' | 60°11.4'                          | S 22°21.8' | 31°15.6'                         | S 22°03.8' | 294°22.2'                      | N 10°24.4' |
| 13  | 57°41.5'                         | S 21°11.1' | 75°13.5'                          | S 22°21.8' | 46°17.7'                         | S 22°03.7' | 309°23.0'                      | N 10°25.0' |
| 14  | 72°40.8'                         | S 21°11.1' | 90°15.5'                          | S 22°21.9' | 61°19.9'                         | S 22°03.7' | 324°23.9'                      | N 10°25.7' |
| 15  | 87°40.2'                         | S 21°11.1' | 105°17.5'                         | S 22°21.9' | 76°22.1'                         | S 22°03.7' | 339°24.8'                      | N 10°26.3' |
| 16  | 102°39.6'                        | S 21°11.2' | 120°19.6'                         | S 22°21.9' | 91°24.3'                         | S 22°03.6' | 354°25.7'                      | N 10°26.9' |
| 17  | 117°39.0'                        | S 21°11.2' | 135°21.6'                         | S 22°22.0' | 106°26.5'                        | S 22°03.6' | 9°26.5'                        | N 10°27.6' |
| 18  | 132°38.4'                        | S 21°11.2' | 150°23.6'                         | S 22°22.0' | 121°28.7'                        | S 22°03.6' | 24°27.4'                       | N 10°28.2' |
| 19  | 147°37.7'                        | S 21°11.3' | 165°25.7'                         | S 22°22.0' | 136°30.8'                        | S 22°03.6' | 39°28.3'                       | N 10°28.9' |
| 20  | 162°37.1'                        | S 21°11.3' | 180°27.7'                         | S 22°22.1' | 151°33.0'                        | S 22°03.5' | 54°29.2'                       | N 10°29.5' |
| 21  | 177°36.5'                        | S 21°11.3' | 195°29.7'                         | S 22°22.1' | 166°35.2'                        | S 22°03.5' | 69°30.0'                       | N 10°30.2' |
| 22  | 192°35.9'                        | S 21°11.4' | 210°31.8'                         | S 22°22.1' | 181°37.4'                        | S 22°03.5' | 84°30.9'                       | N 10°30.8' |
| 23  | 207°35.2'                        | S 21°11.4' | 225°33.8'                         | S 22°22.2' | 196°39.6'                        | S 22°03.4' | 99°31.8'                       | N 10°31.5' |

Sat Feb 9, 2019 UTC

| UTC | Venus -4.1         |            | Jupiter -1.8      |            | Saturn +0.6       |            | Mars +1.0         |            |
|-----|--------------------|------------|-------------------|------------|-------------------|------------|-------------------|------------|
|     | v = -0.6' d = 0.0' |            | v = 2.0' d = 0.0' |            | v = 2.2' d = 0.0' |            | v = 0.9' d = 0.6' |            |
|     | GHA                | dec        | GHA               | dec        | GHA               | dec        | GHA               | dec        |
| 0   | 222°34.6'          | S 21°11.4' | 240°35.9'         | S 22°22.2' | 211°41.8'         | S 22°03.4' | 114°32.7'         | N 10°32.1' |
| 1   | 237°34.0'          | S 21°11.5' | 255°37.9'         | S 22°22.2' | 226°43.9'         | S 22°03.4' | 129°33.5'         | N 10°32.8' |
| 2   | 252°33.4'          | S 21°11.5' | 270°39.9'         | S 22°22.2' | 241°46.1'         | S 22°03.4' | 144°34.4'         | N 10°33.4' |
| 3   | 267°32.7'          | S 21°11.5' | 285°42.0'         | S 22°22.3' | 256°48.3'         | S 22°03.3' | 159°35.3'         | N 10°34.1' |
| 4   | 282°32.1'          | S 21°11.5' | 300°44.0'         | S 22°22.3' | 271°50.5'         | S 22°03.3' | 174°36.1'         | N 10°34.7' |
| 5   | 297°31.5'          | S 21°11.5' | 315°46.0'         | S 22°22.3' | 286°52.7'         | S 22°03.3' | 189°37.0'         | N 10°35.4' |
| 6   | 312°30.8'          | S 21°11.6' | 330°48.1'         | S 22°22.4' | 301°54.9'         | S 22°03.2' | 204°37.9'         | N 10°36.0' |
| 7   | 327°30.2'          | S 21°11.6' | 345°50.1'         | S 22°22.4' | 316°57.0'         | S 22°03.2' | 219°38.8'         | N 10°36.6' |
| 8   | 342°29.6'          | S 21°11.6' | 0°52.1'           | S 22°22.4' | 331°59.2'         | S 22°03.2' | 234°39.6'         | N 10°37.3' |
| 9   | 357°29.0'          | S 21°11.6' | 15°54.2'          | S 22°22.5' | 347°01.4'         | S 22°03.2' | 249°40.5'         | N 10°37.9' |
| 10  | 12°28.3'           | S 21°11.6' | 30°56.2'          | S 22°22.5' | 2°03.6'           | S 22°03.1' | 264°41.4'         | N 10°38.6' |
| 11  | 27°27.7'           | S 21°11.7' | 45°58.3'          | S 22°22.5' | 17°05.8'          | S 22°03.1' | 279°42.2'         | N 10°39.2' |
| 12  | 42°27.1'           | S 21°11.7' | 61°00.3'          | S 22°22.6' | 32°08.0'          | S 22°03.1' | 294°43.1'         | N 10°39.9' |
| 13  | 57°26.5'           | S 21°11.7' | 76°02.3'          | S 22°22.6' | 47°10.2'          | S 22°03.0' | 309°44.0'         | N 10°40.5' |
| 14  | 72°25.8'           | S 21°11.7' | 91°04.4'          | S 22°22.6' | 62°12.3'          | S 22°03.0' | 324°44.9'         | N 10°41.2' |
| 15  | 87°25.2'           | S 21°11.7' | 106°06.4'         | S 22°22.7' | 77°14.5'          | S 22°03.0' | 339°45.7'         | N 10°41.8' |
| 16  | 102°24.6'          | S 21°11.7' | 121°08.5'         | S 22°22.7' | 92°16.7'          | S 22°03.0' | 354°46.6'         | N 10°42.4' |
| 17  | 117°23.9'          | S 21°11.7' | 136°10.5'         | S 22°22.7' | 107°18.9'         | S 22°02.9' | 9°47.5'           | N 10°43.1' |
| 18  | 132°23.3'          | S 21°11.8' | 151°12.5'         | S 22°22.8' | 122°21.1'         | S 22°02.9' | 24°48.3'          | N 10°43.7' |
| 19  | 147°22.7'          | S 21°11.8' | 166°14.6'         | S 22°22.8' | 137°23.3'         | S 22°02.9' | 39°49.2'          | N 10°44.4' |
| 20  | 162°22.0'          | S 21°11.8' | 181°16.6'         | S 22°22.8' | 152°25.4'         | S 22°02.8' | 54°50.1'          | N 10°45.0' |
| 21  | 177°21.4'          | S 21°11.8' | 196°18.6'         | S 22°22.9' | 167°27.6'         | S 22°02.8' | 69°51.0'          | N 10°45.7' |
| 22  | 192°20.8'          | S 21°11.8' | 211°20.7'         | S 22°22.9' | 182°29.8'         | S 22°02.8' | 84°51.8'          | N 10°46.3' |
| 23  | 207°20.2'          | S 21°11.8' | 226°22.7'         | S 22°22.9' | 197°32.0'         | S 22°02.8' | 99°52.7'          | N 10°46.9' |

Sun Feb 10, 2019 UTC

| UTC | Venus -4.1         |            | Jupiter -1.8      |            | Saturn +0.6       |            | Mars +1.0         |            |
|-----|--------------------|------------|-------------------|------------|-------------------|------------|-------------------|------------|
|     | v = -0.6' d = 0.0' |            | v = 2.0' d = 0.0' |            | v = 2.2' d = 0.0' |            | v = 0.9' d = 0.6' |            |
|     | GHA                | dec        | GHA               | dec        | GHA               | dec        | GHA               | dec        |
| 0   | 222°19.5'          | S 21°11.8' | 241°24.8'         | S 22°22.9' | 212°34.2'         | S 22°02.7' | 114°53.6'         | N 10°47.6' |
| 1   | 237°18.9'          | S 21°11.8' | 256°26.8'         | S 22°23.0' | 227°36.4'         | S 22°02.7' | 129°54.4'         | N 10°48.2' |
| 2   | 252°18.3'          | S 21°11.8' | 271°28.9'         | S 22°23.0' | 242°38.6'         | S 22°02.7' | 144°55.3'         | N 10°48.9' |
| 3   | 267°17.6'          | S 21°11.8' | 286°30.9'         | S 22°23.0' | 257°40.7'         | S 22°02.6' | 159°56.2'         | N 10°49.5' |
| 4   | 282°17.0'          | S 21°11.8' | 301°32.9'         | S 22°23.1' | 272°42.9'         | S 22°02.6' | 174°57.1'         | N 10°50.2' |
| 5   | 297°16.4'          | S 21°11.8' | 316°35.0'         | S 22°23.1' | 287°45.1'         | S 22°02.6' | 189°57.9'         | N 10°50.8' |
| 6   | 312°15.7'          | S 21°11.8' | 331°37.0'         | S 22°23.1' | 302°47.3'         | S 22°02.6' | 204°58.8'         | N 10°51.4' |
| 7   | 327°15.1'          | S 21°11.8' | 346°39.1'         | S 22°23.2' | 317°49.5'         | S 22°02.5' | 219°59.7'         | N 10°52.1' |
| 8   | 342°14.5'          | S 21°11.8' | 1°41.1'           | S 22°23.2' | 332°51.7'         | S 22°02.5' | 235°00.5'         | N 10°52.7' |
| 9   | 357°13.8'          | S 21°11.8' | 16°43.1'          | S 22°23.2' | 347°53.9'         | S 22°02.5' | 250°01.4'         | N 10°53.4' |
| 10  | 12°13.2'           | S 21°11.8' | 31°45.2'          | S 22°23.3' | 2°56.1'           | S 22°02.4' | 265°02.3'         | N 10°54.0' |
| 11  | 27°12.6'           | S 21°11.8' | 46°47.2'          | S 22°23.3' | 17°58.2'          | S 22°02.4' | 280°03.1'         | N 10°54.6' |
| 12  | 42°11.9'           | S 21°11.8' | 61°49.3'          | S 22°23.3' | 33°00.4'          | S 22°02.4' | 295°04.0'         | N 10°55.3' |
| 13  | 57°11.3'           | S 21°11.8' | 76°51.3'          | S 22°23.4' | 48°02.6'          | S 22°02.4' | 310°04.9'         | N 10°55.9' |
| 14  | 72°10.7'           | S 21°11.8' | 91°53.4'          | S 22°23.4' | 63°04.8'          | S 22°02.3' | 325°05.7'         | N 10°56.6' |
| 15  | 87°10.0'           | S 21°11.7' | 106°55.4'         | S 22°23.4' | 78°07.0'          | S 22°02.3' | 340°06.6'         | N 10°57.2' |
| 16  | 102°09.4'          | S 21°11.7' | 121°57.4'         | S 22°23.4' | 93°09.2'          | S 22°02.3' | 355°07.5'         | N 10°57.8' |
| 17  | 117°08.8'          | S 21°11.7' | 136°59.5'         | S 22°23.5' | 108°11.4'         | S 22°02.2' | 10°08.4'          | N 10°58.5' |
| 18  | 132°08.1'          | S 21°11.7' | 152°01.5'         | S 22°23.5' | 123°13.5'         | S 22°02.2' | 25°09.2'          | N 10°59.1' |
| 19  | 147°07.5'          | S 21°11.7' | 167°03.6'         | S 22°23.5' | 138°15.7'         | S 22°02.2' | 40°10.1'          | N 10°59.8' |
| 20  | 162°06.9'          | S 21°11.7' | 182°05.6'         | S 22°23.6' | 153°17.9'         | S 22°02.2' | 55°11.0'          | N 11°00.4' |
| 21  | 177°06.2'          | S 21°11.7' | 197°07.7'         | S 22°23.6' | 168°20.1'         | S 22°02.1' | 70°11.8'          | N 11°01.0' |
| 22  | 192°05.6'          | S 21°11.6' | 212°09.7'         | S 22°23.6' | 183°22.3'         | S 22°02.1' | 85°12.7'          | N 11°01.7' |
| 23  | 207°05.0'          | S 21°11.6' | 227°11.8'         | S 22°23.7' | 198°24.5'         | S 22°02.1' | 100°13.6'         | N 11°02.3' |

Mon Feb 11, 2019 UTC

| UTC | Venus -4.0<br>v = -0.6' d = 0.0' |            | Jupiter -1.8<br>v = 2.0' d = 0.0' |            | Saturn +0.6<br>v = 2.2' d = 0.0' |            | Mars +1.0<br>v = 0.9' d = 0.6' |            |
|-----|----------------------------------|------------|-----------------------------------|------------|----------------------------------|------------|--------------------------------|------------|
|     | GHA                              | dec        | GHA                               | dec        | GHA                              | dec        | GHA                            | dec        |
| 0   | 222°04.3'                        | S 21°11.6' | 242°13.8'                         | S 22°23.7' | 213°26.7'                        | S 22°02.0' | 115°14.4'                      | N 11°03.0' |
| 1   | 237°03.7'                        | S 21°11.6' | 257°15.9'                         | S 22°23.7' | 228°28.9'                        | S 22°02.0' | 130°15.3'                      | N 11°03.6' |
| 2   | 252°03.0'                        | S 21°11.6' | 272°17.9'                         | S 22°23.7' | 243°31.0'                        | S 22°02.0' | 145°16.2'                      | N 11°04.2' |
| 3   | 267°02.4'                        | S 21°11.5' | 287°19.9'                         | S 22°23.8' | 258°33.2'                        | S 22°02.0' | 160°17.0'                      | N 11°04.9' |
| 4   | 282°01.8'                        | S 21°11.5' | 302°22.0'                         | S 22°23.8' | 273°35.4'                        | S 22°01.9' | 175°17.9'                      | N 11°05.5' |
| 5   | 297°01.1'                        | S 21°11.5' | 317°24.0'                         | S 22°23.8' | 288°37.6'                        | S 22°01.9' | 190°18.8'                      | N 11°06.2' |
| 6   | 312°00.5'                        | S 21°11.5' | 332°26.1'                         | S 22°23.9' | 303°39.8'                        | S 22°01.9' | 205°19.6'                      | N 11°06.8' |
| 7   | 326°59.9'                        | S 21°11.4' | 347°28.1'                         | S 22°23.9' | 318°42.0'                        | S 22°01.8' | 220°20.5'                      | N 11°07.4' |
| 8   | 341°59.2'                        | S 21°11.4' | 2°30.2'                           | S 22°23.9' | 333°44.2'                        | S 22°01.8' | 235°21.4'                      | N 11°08.1' |
| 9   | 356°58.6'                        | S 21°11.4' | 17°32.2'                          | S 22°24.0' | 348°46.4'                        | S 22°01.8' | 250°22.2'                      | N 11°08.7' |
| 10  | 11°57.9'                         | S 21°11.4' | 32°34.3'                          | S 22°24.0' | 3°48.6'                          | S 22°01.8' | 265°23.1'                      | N 11°09.3' |
| 11  | 26°57.3'                         | S 21°11.3' | 47°36.3'                          | S 22°24.0' | 18°50.7'                         | S 22°01.7' | 280°24.0'                      | N 11°10.0' |
| 12  | 41°56.7'                         | S 21°11.3' | 62°38.4'                          | S 22°24.0' | 33°52.9'                         | S 22°01.7' | 295°24.8'                      | N 11°10.6' |
| 13  | 56°56.0'                         | S 21°11.3' | 77°40.4'                          | S 22°24.1' | 48°55.1'                         | S 22°01.7' | 310°25.7'                      | N 11°11.3' |
| 14  | 71°55.4'                         | S 21°11.2' | 92°42.5'                          | S 22°24.1' | 63°57.3'                         | S 22°01.6' | 325°26.6'                      | N 11°11.9' |
| 15  | 86°54.7'                         | S 21°11.2' | 107°44.5'                         | S 22°24.1' | 78°59.5'                         | S 22°01.6' | 340°27.4'                      | N 11°12.5' |
| 16  | 101°54.1'                        | S 21°11.2' | 122°46.6'                         | S 22°24.2' | 94°01.7'                         | S 22°01.6' | 355°28.3'                      | N 11°13.2' |
| 17  | 116°53.5'                        | S 21°11.1' | 137°48.6'                         | S 22°24.2' | 109°03.9'                        | S 22°01.6' | 10°29.2'                       | N 11°13.8' |
| 18  | 131°52.8'                        | S 21°11.1' | 152°50.7'                         | S 22°24.2' | 124°06.1'                        | S 22°01.5' | 25°30.0'                       | N 11°14.4' |
| 19  | 146°52.2'                        | S 21°11.1' | 167°52.7'                         | S 22°24.3' | 139°08.3'                        | S 22°01.5' | 40°30.9'                       | N 11°15.1' |
| 20  | 161°51.5'                        | S 21°11.0' | 182°54.8'                         | S 22°24.3' | 154°10.4'                        | S 22°01.5' | 55°31.8'                       | N 11°15.7' |
| 21  | 176°50.9'                        | S 21°11.0' | 197°56.8'                         | S 22°24.3' | 169°12.6'                        | S 22°01.4' | 70°32.6'                       | N 11°16.3' |
| 22  | 191°50.3'                        | S 21°10.9' | 212°58.9'                         | S 22°24.3' | 184°14.8'                        | S 22°01.4' | 85°33.5'                       | N 11°17.0' |
| 23  | 206°49.6'                        | S 21°10.9' | 228°00.9'                         | S 22°24.4' | 199°17.0'                        | S 22°01.4' | 100°34.4'                      | N 11°17.6' |

Tue Feb 12, 2019 UTC

| UTC | Venus -4.0<br>v = -0.6' d = 0.1' |            | Jupiter -1.8<br>v = 2.1' d = 0.0' |            | Saturn +0.6<br>v = 2.2' d = 0.0' |            | Mars +1.0<br>v = 0.9' d = 0.6' |            |
|-----|----------------------------------|------------|-----------------------------------|------------|----------------------------------|------------|--------------------------------|------------|
|     | GHA                              | dec        | GHA                               | dec        | GHA                              | dec        | GHA                            | dec        |
| 0   | 221°49.0'                        | S 21°10.9' | 243°03.0'                         | S 22°24.4' | 214°19.2'                        | S 22°01.4' | 115°35.2'                      | N 11°18.3' |
| 1   | 236°48.3'                        | S 21°10.8' | 258°05.0'                         | S 22°24.4' | 229°21.4'                        | S 22°01.3' | 130°36.1'                      | N 11°18.9' |
| 2   | 251°47.7'                        | S 21°10.8' | 273°07.1'                         | S 22°24.5' | 244°23.6'                        | S 22°01.3' | 145°37.0'                      | N 11°19.5' |
| 3   | 266°47.1'                        | S 21°10.7' | 288°09.1'                         | S 22°24.5' | 259°25.8'                        | S 22°01.3' | 160°37.8'                      | N 11°20.2' |
| 4   | 281°46.4'                        | S 21°10.7' | 303°11.2'                         | S 22°24.5' | 274°28.0'                        | S 22°01.2' | 175°38.7'                      | N 11°20.8' |
| 5   | 296°45.8'                        | S 21°10.6' | 318°13.2'                         | S 22°24.6' | 289°30.2'                        | S 22°01.2' | 190°39.6'                      | N 11°21.4' |
| 6   | 311°45.1'                        | S 21°10.6' | 333°15.3'                         | S 22°24.6' | 304°32.3'                        | S 22°01.2' | 205°40.4'                      | N 11°22.1' |
| 7   | 326°44.5'                        | S 21°10.5' | 348°17.3'                         | S 22°24.6' | 319°34.5'                        | S 22°01.2' | 220°41.3'                      | N 11°22.7' |
| 8   | 341°43.8'                        | S 21°10.5' | 3°19.4'                           | S 22°24.6' | 334°36.7'                        | S 22°01.1' | 235°42.2'                      | N 11°23.3' |
| 9   | 356°43.2'                        | S 21°10.4' | 18°21.4'                          | S 22°24.7' | 349°38.9'                        | S 22°01.1' | 250°43.0'                      | N 11°24.0' |
| 10  | 11°42.6'                         | S 21°10.4' | 33°23.5'                          | S 22°24.7' | 4°41.1'                          | S 22°01.1' | 265°43.9'                      | N 11°24.6' |
| 11  | 26°41.9'                         | S 21°10.3' | 48°25.5'                          | S 22°24.7' | 19°43.3'                         | S 22°01.0' | 280°44.8'                      | N 11°25.2' |
| 12  | 41°41.3'                         | S 21°10.3' | 63°27.6'                          | S 22°24.8' | 34°45.5'                         | S 22°01.0' | 295°45.6'                      | N 11°25.9' |
| 13  | 56°40.6'                         | S 21°10.2' | 78°29.6'                          | S 22°24.8' | 49°47.7'                         | S 22°01.0' | 310°46.5'                      | N 11°26.5' |
| 14  | 71°40.0'                         | S 21°10.2' | 93°31.7'                          | S 22°24.8' | 64°49.9'                         | S 22°01.0' | 325°47.3'                      | N 11°27.1' |
| 15  | 86°39.3'                         | S 21°10.1' | 108°33.8'                         | S 22°24.8' | 79°52.1'                         | S 22°00.9' | 340°48.2'                      | N 11°27.8' |
| 16  | 101°38.7'                        | S 21°10.0' | 123°35.8'                         | S 22°24.9' | 94°54.3'                         | S 22°00.9' | 355°49.1'                      | N 11°28.4' |
| 17  | 116°38.1'                        | S 21°10.0' | 138°37.9'                         | S 22°24.9' | 109°56.4'                        | S 22°00.9' | 10°49.9'                       | N 11°29.0' |
| 18  | 131°37.4'                        | S 21°09.9' | 153°39.9'                         | S 22°24.9' | 124°58.6'                        | S 22°00.8' | 25°50.8'                       | N 11°29.7' |
| 19  | 146°36.8'                        | S 21°09.9' | 168°42.0'                         | S 22°25.0' | 140°00.8'                        | S 22°00.8' | 40°51.7'                       | N 11°30.3' |
| 20  | 161°36.1'                        | S 21°09.8' | 183°44.0'                         | S 22°25.0' | 155°03.0'                        | S 22°00.8' | 55°52.5'                       | N 11°30.9' |
| 21  | 176°35.5'                        | S 21°09.7' | 198°46.1'                         | S 22°25.0' | 170°05.2'                        | S 22°00.8' | 70°53.4'                       | N 11°31.6' |
| 22  | 191°34.8'                        | S 21°09.7' | 213°48.1'                         | S 22°25.0' | 185°07.4'                        | S 22°00.7' | 85°54.3'                       | N 11°32.2' |
| 23  | 206°34.2'                        | S 21°09.6' | 228°50.2'                         | S 22°25.1' | 200°09.6'                        | S 22°00.7' | 100°55.1'                      | N 11°32.8' |

Wed Feb 13, 2019 UTC

| UTC | Venus -4.0         |            | Jupiter -1.8      |            | Saturn +0.6       |            | Mars +1.0         |            |
|-----|--------------------|------------|-------------------|------------|-------------------|------------|-------------------|------------|
|     | v = -0.6' d = 0.1' |            | v = 2.1' d = 0.0' |            | v = 2.2' d = 0.0' |            | v = 0.9' d = 0.6' |            |
|     | GHA                | dec        | GHA               | dec        | GHA               | dec        | GHA               | dec        |
| 0   | 221°33.5'          | S 21°09.5' | 243°52.2'         | S 22°25.1' | 215°11.8'         | S 22°00.7' | 115°56.0'         | N 11°33.4' |
| 1   | 236°32.9'          | S 21°09.5' | 258°54.3'         | S 22°25.1' | 230°14.0'         | S 22°00.6' | 130°56.8'         | N 11°34.1' |
| 2   | 251°32.3'          | S 21°09.4' | 273°56.4'         | S 22°25.2' | 245°16.2'         | S 22°00.6' | 145°57.7'         | N 11°34.7' |
| 3   | 266°31.6'          | S 21°09.3' | 288°58.4'         | S 22°25.2' | 260°18.4'         | S 22°00.6' | 160°58.6'         | N 11°35.3' |
| 4   | 281°31.0'          | S 21°09.3' | 304°00.5'         | S 22°25.2' | 275°20.6'         | S 22°00.6' | 175°59.4'         | N 11°36.0' |
| 5   | 296°30.3'          | S 21°09.2' | 319°02.5'         | S 22°25.2' | 290°22.7'         | S 22°00.5' | 191°00.3'         | N 11°36.6' |
| 6   | 311°29.7'          | S 21°09.1' | 334°04.6'         | S 22°25.3' | 305°24.9'         | S 22°00.5' | 206°01.2'         | N 11°37.2' |
| 7   | 326°29.0'          | S 21°09.0' | 349°06.6'         | S 22°25.3' | 320°27.1'         | S 22°00.5' | 221°02.0'         | N 11°37.9' |
| 8   | 341°28.4'          | S 21°09.0' | 4°08.7'           | S 22°25.3' | 335°29.3'         | S 22°00.4' | 236°02.9'         | N 11°38.5' |
| 9   | 356°27.7'          | S 21°08.9' | 19°10.8'          | S 22°25.4' | 350°31.5'         | S 22°00.4' | 251°03.7'         | N 11°39.1' |
| 10  | 11°27.1'           | S 21°08.8' | 34°12.8'          | S 22°25.4' | 5°33.7'           | S 22°00.4' | 266°04.6'         | N 11°39.7' |
| 11  | 26°26.4'           | S 21°08.7' | 49°14.9'          | S 22°25.4' | 20°35.9'          | S 22°00.4' | 281°05.5'         | N 11°40.4' |
| 12  | 41°25.8'           | S 21°08.7' | 64°16.9'          | S 22°25.4' | 35°38.1'          | S 22°00.3' | 296°06.3'         | N 11°41.0' |
| 13  | 56°25.1'           | S 21°08.6' | 79°19.0'          | S 22°25.5' | 50°40.3'          | S 22°00.3' | 311°07.2'         | N 11°41.6' |
| 14  | 71°24.5'           | S 21°08.5' | 94°21.1'          | S 22°25.5' | 65°42.5'          | S 22°00.3' | 326°08.1'         | N 11°42.3' |
| 15  | 86°23.9'           | S 21°08.4' | 109°23.1'         | S 22°25.5' | 80°44.7'          | S 22°00.2' | 341°08.9'         | N 11°42.9' |
| 16  | 101°23.2'          | S 21°08.3' | 124°25.2'         | S 22°25.6' | 95°46.9'          | S 22°00.2' | 356°09.8'         | N 11°43.5' |
| 17  | 116°22.6'          | S 21°08.3' | 139°27.2'         | S 22°25.6' | 110°49.1'         | S 22°00.2' | 11°10.6'          | N 11°44.2' |
| 18  | 131°21.9'          | S 21°08.2' | 154°29.3'         | S 22°25.6' | 125°51.3'         | S 22°00.2' | 26°11.5'          | N 11°44.8' |
| 19  | 146°21.3'          | S 21°08.1' | 169°31.3'         | S 22°25.6' | 140°53.4'         | S 22°00.1' | 41°12.4'          | N 11°45.4' |
| 20  | 161°20.6'          | S 21°08.0' | 184°33.4'         | S 22°25.7' | 155°55.6'         | S 22°00.1' | 56°13.2'          | N 11°46.0' |
| 21  | 176°20.0'          | S 21°07.9' | 199°35.5'         | S 22°25.7' | 170°57.8'         | S 22°00.1' | 71°14.1'          | N 11°46.7' |
| 22  | 191°19.3'          | S 21°07.8' | 214°37.5'         | S 22°25.7' | 186°00.0'         | S 22°00.0' | 86°14.9'          | N 11°47.3' |
| 23  | 206°18.7'          | S 21°07.7' | 229°39.6'         | S 22°25.8' | 201°02.2'         | S 22°00.0' | 101°15.8'         | N 11°47.9' |

Thu Feb 14, 2019 UTC

| UTC | Venus -4.0         |            | Jupiter -1.8      |            | Saturn +0.6       |            | Mars +1.0         |            |
|-----|--------------------|------------|-------------------|------------|-------------------|------------|-------------------|------------|
|     | v = -0.7' d = 0.1' |            | v = 2.1' d = 0.0' |            | v = 2.2' d = 0.0' |            | v = 0.9' d = 0.6' |            |
|     | GHA                | dec        | GHA               | dec        | GHA               | dec        | GHA               | dec        |
| 0   | 221°18.0'          | S 21°07.6' | 244°41.7'         | S 22°25.8' | 216°04.4'         | S 21°60.0' | 116°16.7'         | N 11°48.5' |
| 1   | 236°17.4'          | S 21°07.6' | 259°43.7'         | S 22°25.8' | 231°06.6'         | S 21°60.0' | 131°17.5'         | N 11°49.2' |
| 2   | 251°16.7'          | S 21°07.5' | 274°45.8'         | S 22°25.8' | 246°08.8'         | S 21°59.9' | 146°18.4'         | N 11°49.8' |
| 3   | 266°16.1'          | S 21°07.4' | 289°47.8'         | S 22°25.9' | 261°11.0'         | S 21°59.9' | 161°19.2'         | N 11°50.4' |
| 4   | 281°15.4'          | S 21°07.3' | 304°49.9'         | S 22°25.9' | 276°13.2'         | S 21°59.9' | 176°20.1'         | N 11°51.1' |
| 5   | 296°14.8'          | S 21°07.2' | 319°52.0'         | S 22°25.9' | 291°15.4'         | S 21°59.8' | 191°21.0'         | N 11°51.7' |
| 6   | 311°14.1'          | S 21°07.1' | 334°54.0'         | S 22°26.0' | 306°17.6'         | S 21°59.8' | 206°21.8'         | N 11°52.3' |
| 7   | 326°13.5'          | S 21°07.0' | 349°56.1'         | S 22°26.0' | 321°19.8'         | S 21°59.8' | 221°22.7'         | N 11°52.9' |
| 8   | 341°12.8'          | S 21°06.9' | 4°58.2'           | S 22°26.0' | 336°22.0'         | S 21°59.8' | 236°23.5'         | N 11°53.6' |
| 9   | 356°12.2'          | S 21°06.8' | 20°00.2'          | S 22°26.0' | 351°24.2'         | S 21°59.7' | 251°24.4'         | N 11°54.2' |
| 10  | 11°11.5'           | S 21°06.7' | 35°02.3'          | S 22°26.1' | 6°26.4'           | S 21°59.7' | 266°25.3'         | N 11°54.8' |
| 11  | 26°10.9'           | S 21°06.6' | 50°04.3'          | S 22°26.1' | 21°28.6'          | S 21°59.7' | 281°26.1'         | N 11°55.4' |
| 12  | 41°10.2'           | S 21°06.5' | 65°06.4'          | S 22°26.1' | 36°30.8'          | S 21°59.6' | 296°27.0'         | N 11°56.1' |
| 13  | 56°09.6'           | S 21°06.4' | 80°08.5'          | S 22°26.1' | 51°33.0'          | S 21°59.6' | 311°27.8'         | N 11°56.7' |
| 14  | 71°08.9'           | S 21°06.3' | 95°10.5'          | S 22°26.2' | 66°35.1'          | S 21°59.6' | 326°28.7'         | N 11°57.3' |
| 15  | 86°08.3'           | S 21°06.2' | 110°12.6'         | S 22°26.2' | 81°37.3'          | S 21°59.6' | 341°29.6'         | N 11°57.9' |
| 16  | 101°07.6'          | S 21°06.1' | 125°14.7'         | S 22°26.2' | 96°39.5'          | S 21°59.5' | 356°30.4'         | N 11°58.6' |
| 17  | 116°07.0'          | S 21°06.0' | 140°16.7'         | S 22°26.3' | 111°41.7'         | S 21°59.5' | 11°31.3'          | N 11°59.2' |
| 18  | 131°06.3'          | S 21°05.9' | 155°18.8'         | S 22°26.3' | 126°43.9'         | S 21°59.5' | 26°32.1'          | N 11°59.8' |
| 19  | 146°05.7'          | S 21°05.7' | 170°20.9'         | S 22°26.3' | 141°46.1'         | S 21°59.4' | 41°33.0'          | N 12°00.4' |
| 20  | 161°05.0'          | S 21°05.6' | 185°22.9'         | S 22°26.3' | 156°48.3'         | S 21°59.4' | 56°33.9'          | N 12°01.1' |
| 21  | 176°04.4'          | S 21°05.5' | 200°25.0'         | S 22°26.4' | 171°50.5'         | S 21°59.4' | 71°34.7'          | N 12°01.7' |
| 22  | 191°03.7'          | S 21°05.4' | 215°27.1'         | S 22°26.4' | 186°52.7'         | S 21°59.4' | 86°35.6'          | N 12°02.3' |
| 23  | 206°03.1'          | S 21°05.3' | 230°29.1'         | S 22°26.4' | 201°54.9'         | S 21°59.3' | 101°36.4'         | N 12°02.9' |

Fri Feb 15, 2019 UTC

| UTC | Venus -4.0         |            | Jupiter -1.8      |            | Saturn +0.6       |            | Mars +1.1         |            |
|-----|--------------------|------------|-------------------|------------|-------------------|------------|-------------------|------------|
|     | v = -0.7' d = 0.1' |            | v = 2.1' d = 0.0' |            | v = 2.2' d = 0.0' |            | v = 0.9' d = 0.6' |            |
|     | GHA                | dec        | GHA               | dec        | GHA               | dec        | GHA               | dec        |
| 0   | 221°02.4'          | S 21°05.2' | 245°31.2'         | S 22°26.4' | 216°57.1'         | S 21°59.3' | 116°37.3'         | N 12°03.5' |
| 1   | 236°01.8'          | S 21°05.1' | 260°33.3'         | S 22°26.5' | 231°59.3'         | S 21°59.3' | 131°38.1'         | N 12°04.2' |
| 2   | 251°01.1'          | S 21°05.0' | 275°35.3'         | S 22°26.5' | 247°01.5'         | S 21°59.2' | 146°39.0'         | N 12°04.8' |
| 3   | 266°00.5'          | S 21°04.8' | 290°37.4'         | S 22°26.5' | 262°03.7'         | S 21°59.2' | 161°39.9'         | N 12°05.4' |
| 4   | 280°59.8'          | S 21°04.7' | 305°39.5'         | S 22°26.6' | 277°05.9'         | S 21°59.2' | 176°40.7'         | N 12°06.0' |
| 5   | 295°59.2'          | S 21°04.6' | 320°41.5'         | S 22°26.6' | 292°08.1'         | S 21°59.2' | 191°41.6'         | N 12°06.7' |
| 6   | 310°58.5'          | S 21°04.5' | 335°43.6'         | S 22°26.6' | 307°10.3'         | S 21°59.1' | 206°42.4'         | N 12°07.3' |
| 7   | 325°57.8'          | S 21°04.4' | 350°45.7'         | S 22°26.6' | 322°12.5'         | S 21°59.1' | 221°43.3'         | N 12°07.9' |
| 8   | 340°57.2'          | S 21°04.2' | 5°47.7'           | S 22°26.7' | 337°14.7'         | S 21°59.1' | 236°44.1'         | N 12°08.5' |
| 9   | 355°56.5'          | S 21°04.1' | 20°49.8'          | S 22°26.7' | 352°16.9'         | S 21°59.0' | 251°45.0'         | N 12°09.1' |
| 10  | 10°55.9'           | S 21°04.0' | 35°51.9'          | S 22°26.7' | 7°19.1'           | S 21°59.0' | 266°45.9'         | N 12°09.8' |
| 11  | 25°55.2'           | S 21°03.9' | 50°53.9'          | S 22°26.7' | 22°21.3'          | S 21°59.0' | 281°46.7'         | N 12°10.4' |
| 12  | 40°54.6'           | S 21°03.7' | 65°56.0'          | S 22°26.8' | 37°23.5'          | S 21°59.0' | 296°47.6'         | N 12°11.0' |
| 13  | 55°53.9'           | S 21°03.6' | 80°58.1'          | S 22°26.8' | 52°25.7'          | S 21°58.9' | 311°48.4'         | N 12°11.6' |
| 14  | 70°53.3'           | S 21°03.5' | 96°00.1'          | S 22°26.8' | 67°27.9'          | S 21°58.9' | 326°49.3'         | N 12°12.3' |
| 15  | 85°52.6'           | S 21°03.3' | 111°02.2'         | S 22°26.9' | 82°30.1'          | S 21°58.9' | 341°50.1'         | N 12°12.9' |
| 16  | 100°52.0'          | S 21°03.2' | 126°04.3'         | S 22°26.9' | 97°32.3'          | S 21°58.9' | 356°51.0'         | N 12°13.5' |
| 17  | 115°51.3'          | S 21°03.1' | 141°06.4'         | S 22°26.9' | 112°34.5'         | S 21°58.8' | 11°51.9'          | N 12°14.1' |
| 18  | 130°50.7'          | S 21°03.0' | 156°08.4'         | S 22°26.9' | 127°36.7'         | S 21°58.8' | 26°52.7'          | N 12°14.7' |
| 19  | 145°50.0'          | S 21°02.8' | 171°10.5'         | S 22°27.0' | 142°38.9'         | S 21°58.8' | 41°53.6'          | N 12°15.4' |
| 20  | 160°49.4'          | S 21°02.7' | 186°12.6'         | S 22°27.0' | 157°41.1'         | S 21°58.7' | 56°54.4'          | N 12°16.0' |
| 21  | 175°48.7'          | S 21°02.6' | 201°14.6'         | S 22°27.0' | 172°43.3'         | S 21°58.7' | 71°55.3'          | N 12°16.6' |
| 22  | 190°48.0'          | S 21°02.4' | 216°16.7'         | S 22°27.0' | 187°45.5'         | S 21°58.7' | 86°56.1'          | N 12°17.2' |
| 23  | 205°47.4'          | S 21°02.3' | 231°18.8'         | S 22°27.1' | 202°47.6'         | S 21°58.7' | 101°57.0'         | N 12°17.8' |

Sat Feb 16, 2019 UTC

| UTC | Venus -4.0         |            | Jupiter -1.8      |            | Saturn +0.6       |            | Mars +1.1         |            |
|-----|--------------------|------------|-------------------|------------|-------------------|------------|-------------------|------------|
|     | v = -0.7' d = 0.2' |            | v = 2.1' d = 0.0' |            | v = 2.2' d = 0.0' |            | v = 0.9' d = 0.6' |            |
|     | GHA                | dec        | GHA               | dec        | GHA               | dec        | GHA               | dec        |
| 0   | 220°46.7'          | S 21°02.1' | 246°20.8'         | S 22°27.1' | 217°49.8'         | S 21°58.6' | 116°57.8'         | N 12°18.5' |
| 1   | 235°46.1'          | S 21°02.0' | 261°22.9'         | S 22°27.1' | 232°52.0'         | S 21°58.6' | 131°58.7'         | N 12°19.1' |
| 2   | 250°45.4'          | S 21°01.9' | 276°25.0'         | S 22°27.1' | 247°54.2'         | S 21°58.6' | 146°59.6'         | N 12°19.7' |
| 3   | 265°44.8'          | S 21°01.7' | 291°27.1'         | S 22°27.2' | 262°56.4'         | S 21°58.5' | 162°00.4'         | N 12°20.3' |
| 4   | 280°44.1'          | S 21°01.6' | 306°29.1'         | S 22°27.2' | 277°58.6'         | S 21°58.5' | 177°01.3'         | N 12°20.9' |
| 5   | 295°43.5'          | S 21°01.4' | 321°31.2'         | S 22°27.2' | 293°00.8'         | S 21°58.5' | 192°02.1'         | N 12°21.5' |
| 6   | 310°42.8'          | S 21°01.3' | 336°33.3'         | S 22°27.2' | 308°03.0'         | S 21°58.5' | 207°03.0'         | N 12°22.2' |
| 7   | 325°42.2'          | S 21°01.1' | 351°35.4'         | S 22°27.3' | 323°05.2'         | S 21°58.4' | 222°03.8'         | N 12°22.8' |
| 8   | 340°41.5'          | S 21°01.0' | 6°37.4'           | S 22°27.3' | 338°07.4'         | S 21°58.4' | 237°04.7'         | N 12°23.4' |
| 9   | 355°40.8'          | S 21°00.9' | 21°39.5'          | S 22°27.3' | 353°09.6'         | S 21°58.4' | 252°05.5'         | N 12°24.0' |
| 10  | 10°40.2'           | S 21°00.7' | 36°41.6'          | S 22°27.4' | 8°11.8'           | S 21°58.3' | 267°06.4'         | N 12°24.6' |
| 11  | 25°39.5'           | S 21°00.6' | 51°43.7'          | S 22°27.4' | 23°14.0'          | S 21°58.3' | 282°07.3'         | N 12°25.3' |
| 12  | 40°38.9'           | S 21°00.4' | 66°45.7'          | S 22°27.4' | 38°16.2'          | S 21°58.3' | 297°08.1'         | N 12°25.9' |
| 13  | 55°38.2'           | S 21°00.3' | 81°47.8'          | S 22°27.4' | 53°18.4'          | S 21°58.3' | 312°09.0'         | N 12°26.5' |
| 14  | 70°37.6'           | S 21°00.1' | 96°49.9'          | S 22°27.5' | 68°20.6'          | S 21°58.2' | 327°09.8'         | N 12°27.1' |
| 15  | 85°36.9'           | S 20°59.9' | 111°52.0'         | S 22°27.5' | 83°22.8'          | S 21°58.2' | 342°10.7'         | N 12°27.7' |
| 16  | 100°36.3'          | S 20°59.8' | 126°54.0'         | S 22°27.5' | 98°25.0'          | S 21°58.2' | 357°11.5'         | N 12°28.3' |
| 17  | 115°35.6'          | S 20°59.6' | 141°56.1'         | S 22°27.5' | 113°27.2'         | S 21°58.1' | 12°12.4'          | N 12°28.9' |
| 18  | 130°34.9'          | S 20°59.5' | 156°58.2'         | S 22°27.6' | 128°29.4'         | S 21°58.1' | 27°13.2'          | N 12°29.6' |
| 19  | 145°34.3'          | S 20°59.3' | 172°00.3'         | S 22°27.6' | 143°31.6'         | S 21°58.1' | 42°14.1'          | N 12°30.2' |
| 20  | 160°33.6'          | S 20°59.2' | 187°02.3'         | S 22°27.6' | 158°33.8'         | S 21°58.1' | 57°14.9'          | N 12°30.8' |
| 21  | 175°33.0'          | S 20°59.0' | 202°04.4'         | S 22°27.6' | 173°36.0'         | S 21°58.0' | 72°15.8'          | N 12°31.4' |
| 22  | 190°32.3'          | S 20°58.8' | 217°06.5'         | S 22°27.7' | 188°38.2'         | S 21°58.0' | 87°16.6'          | N 12°32.0' |
| 23  | 205°31.7'          | S 20°58.7' | 232°08.6'         | S 22°27.7' | 203°40.4'         | S 21°58.0' | 102°17.5'         | N 12°32.6' |



Sun Feb 17, 2019 UTC

| UTC | Venus -4.0<br>v = -0.7' d = 0.2' |            | Jupiter -1.8<br>v = 2.1' d = 0.0' |            | Saturn +0.6<br>v = 2.2' d = 0.0' |            | Mars +1.1<br>v = 0.9' d = 0.6' |            |
|-----|----------------------------------|------------|-----------------------------------|------------|----------------------------------|------------|--------------------------------|------------|
|     | GHA                              | dec        | GHA                               | dec        | GHA                              | dec        | GHA                            | dec        |
| 0   | 220°31.0'                        | S 20°58.5' | 247°10.6'                         | S 22°27.7' | 218°42.6'                        | S 21°57.9' | 117°18.3'                      | N 12°33.3' |
| 1   | 235°30.4'                        | S 20°58.4' | 262°12.7'                         | S 22°27.7' | 233°44.8'                        | S 21°57.9' | 132°19.2'                      | N 12°33.9' |
| 2   | 250°29.7'                        | S 20°58.2' | 277°14.8'                         | S 22°27.8' | 248°47.0'                        | S 21°57.9' | 147°20.1'                      | N 12°34.5' |
| 3   | 265°29.0'                        | S 20°58.0' | 292°16.9'                         | S 22°27.8' | 263°49.2'                        | S 21°57.9' | 162°20.9'                      | N 12°35.1' |
| 4   | 280°28.4'                        | S 20°57.9' | 307°19.0'                         | S 22°27.8' | 278°51.4'                        | S 21°57.8' | 177°21.8'                      | N 12°35.7' |
| 5   | 295°27.7'                        | S 20°57.7' | 322°21.0'                         | S 22°27.8' | 293°53.7'                        | S 21°57.8' | 192°22.6'                      | N 12°36.3' |
| 6   | 310°27.1'                        | S 20°57.5' | 337°23.1'                         | S 22°27.9' | 308°55.9'                        | S 21°57.8' | 207°23.5'                      | N 12°36.9' |
| 7   | 325°26.4'                        | S 20°57.4' | 352°25.2'                         | S 22°27.9' | 323°58.1'                        | S 21°57.7' | 222°24.3'                      | N 12°37.6' |
| 8   | 340°25.8'                        | S 20°57.2' | 7°27.3'                           | S 22°27.9' | 339°00.3'                        | S 21°57.7' | 237°25.2'                      | N 12°38.2' |
| 9   | 355°25.1'                        | S 20°57.0' | 22°29.3'                          | S 22°27.9' | 354°02.5'                        | S 21°57.7' | 252°26.0'                      | N 12°38.8' |
| 10  | 10°24.4'                         | S 20°56.8' | 37°31.4'                          | S 22°28.0' | 9°04.7'                          | S 21°57.7' | 267°26.9'                      | N 12°39.4' |
| 11  | 25°23.8'                         | S 20°56.7' | 52°33.5'                          | S 22°28.0' | 24°06.9'                         | S 21°57.6' | 282°27.7'                      | N 12°40.0' |
| 12  | 40°23.1'                         | S 20°56.5' | 67°35.6'                          | S 22°28.0' | 39°09.1'                         | S 21°57.6' | 297°28.6'                      | N 12°40.6' |
| 13  | 55°22.5'                         | S 20°56.3' | 82°37.7'                          | S 22°28.0' | 54°11.3'                         | S 21°57.6' | 312°29.4'                      | N 12°41.2' |
| 14  | 70°21.8'                         | S 20°56.1' | 97°39.7'                          | S 22°28.1' | 69°13.5'                         | S 21°57.5' | 327°30.3'                      | N 12°41.8' |
| 15  | 85°21.2'                         | S 20°56.0' | 112°41.8'                         | S 22°28.1' | 84°15.7'                         | S 21°57.5' | 342°31.1'                      | N 12°42.5' |
| 16  | 100°20.5'                        | S 20°55.8' | 127°43.9'                         | S 22°28.1' | 99°17.9'                         | S 21°57.5' | 357°32.0'                      | N 12°43.1' |
| 17  | 115°19.8'                        | S 20°55.6' | 142°46.0'                         | S 22°28.1' | 114°20.1'                        | S 21°57.5' | 12°32.8'                       | N 12°43.7' |
| 18  | 130°19.2'                        | S 20°55.4' | 157°48.1'                         | S 22°28.2' | 129°22.3'                        | S 21°57.4' | 27°33.7'                       | N 12°44.3' |
| 19  | 145°18.5'                        | S 20°55.3' | 172°50.2'                         | S 22°28.2' | 144°24.5'                        | S 21°57.4' | 42°34.5'                       | N 12°44.9' |
| 20  | 160°17.9'                        | S 20°55.1' | 187°52.2'                         | S 22°28.2' | 159°26.7'                        | S 21°57.4' | 57°35.4'                       | N 12°45.5' |
| 21  | 175°17.2'                        | S 20°54.9' | 202°54.3'                         | S 22°28.2' | 174°28.9'                        | S 21°57.4' | 72°36.2'                       | N 12°46.1' |
| 22  | 190°16.6'                        | S 20°54.7' | 217°56.4'                         | S 22°28.3' | 189°31.1'                        | S 21°57.3' | 87°37.1'                       | N 12°46.7' |
| 23  | 205°15.9'                        | S 20°54.5' | 232°58.5'                         | S 22°28.3' | 204°33.3'                        | S 21°57.3' | 102°37.9'                      | N 12°47.3' |

Mon Feb 18, 2019 UTC

| UTC | Venus -4.0<br>v = -0.7' d = 0.2' |            | Jupiter -1.8<br>v = 2.1' d = 0.0' |            | Saturn +0.6<br>v = 2.2' d = 0.0' |            | Mars +1.1<br>v = 0.8' d = 0.6' |            |
|-----|----------------------------------|------------|-----------------------------------|------------|----------------------------------|------------|--------------------------------|------------|
|     | GHA                              | dec        | GHA                               | dec        | GHA                              | dec        | GHA                            | dec        |
| 0   | 220°15.2'                        | S 20°54.3' | 248°00.6'                         | S 22°28.3' | 219°35.5'                        | S 21°57.3' | 117°38.8'                      | N 12°48.0' |
| 1   | 235°14.6'                        | S 20°54.1' | 263°02.7'                         | S 22°28.3' | 234°37.7'                        | S 21°57.2' | 132°39.6'                      | N 12°48.6' |
| 2   | 250°13.9'                        | S 20°54.0' | 278°04.7'                         | S 22°28.4' | 249°39.9'                        | S 21°57.2' | 147°40.5'                      | N 12°49.2' |
| 3   | 265°13.3'                        | S 20°53.8' | 293°06.8'                         | S 22°28.4' | 264°42.1'                        | S 21°57.2' | 162°41.3'                      | N 12°49.8' |
| 4   | 280°12.6'                        | S 20°53.6' | 308°08.9'                         | S 22°28.4' | 279°44.3'                        | S 21°57.2' | 177°42.2'                      | N 12°50.4' |
| 5   | 295°11.9'                        | S 20°53.4' | 323°11.0'                         | S 22°28.4' | 294°46.5'                        | S 21°57.1' | 192°43.0'                      | N 12°51.0' |
| 6   | 310°11.3'                        | S 20°53.2' | 338°13.1'                         | S 22°28.5' | 309°48.7'                        | S 21°57.1' | 207°43.9'                      | N 12°51.6' |
| 7   | 325°10.6'                        | S 20°53.0' | 353°15.2'                         | S 22°28.5' | 324°50.9'                        | S 21°57.1' | 222°44.7'                      | N 12°52.2' |
| 8   | 340°10.0'                        | S 20°52.8' | 8°17.2'                           | S 22°28.5' | 339°53.1'                        | S 21°57.0' | 237°45.6'                      | N 12°52.8' |
| 9   | 355°09.3'                        | S 20°52.6' | 23°19.3'                          | S 22°28.5' | 354°55.3'                        | S 21°57.0' | 252°46.4'                      | N 12°53.4' |
| 10  | 10°08.7'                         | S 20°52.4' | 38°21.4'                          | S 22°28.6' | 9°57.5'                          | S 21°57.0' | 267°47.3'                      | N 12°54.0' |
| 11  | 25°08.0'                         | S 20°52.2' | 53°23.5'                          | S 22°28.6' | 24°59.7'                         | S 21°57.0' | 282°48.1'                      | N 12°54.7' |
| 12  | 40°07.3'                         | S 20°52.0' | 68°25.6'                          | S 22°28.6' | 40°01.9'                         | S 21°56.9' | 297°49.0'                      | N 12°55.3' |
| 13  | 55°06.7'                         | S 20°51.8' | 83°27.7'                          | S 22°28.6' | 55°04.2'                         | S 21°56.9' | 312°49.8'                      | N 12°55.9' |
| 14  | 70°06.0'                         | S 20°51.6' | 98°29.8'                          | S 22°28.7' | 70°06.4'                         | S 21°56.9' | 327°50.7'                      | N 12°56.5' |
| 15  | 85°05.4'                         | S 20°51.4' | 113°31.8'                         | S 22°28.7' | 85°08.6'                         | S 21°56.8' | 342°51.5'                      | N 12°57.1' |
| 16  | 100°04.7'                        | S 20°51.2' | 128°33.9'                         | S 22°28.7' | 100°10.8'                        | S 21°56.8' | 357°52.4'                      | N 12°57.7' |
| 17  | 115°04.0'                        | S 20°51.0' | 143°36.0'                         | S 22°28.7' | 115°13.0'                        | S 21°56.8' | 12°53.2'                       | N 12°58.3' |
| 18  | 130°03.4'                        | S 20°50.8' | 158°38.1'                         | S 22°28.8' | 130°15.2'                        | S 21°56.8' | 27°54.1'                       | N 12°58.9' |
| 19  | 145°02.7'                        | S 20°50.6' | 173°40.2'                         | S 22°28.8' | 145°17.4'                        | S 21°56.7' | 42°54.9'                       | N 12°59.5' |
| 20  | 160°02.1'                        | S 20°50.4' | 188°42.3'                         | S 22°28.8' | 160°19.6'                        | S 21°56.7' | 57°55.8'                       | N 13°00.1' |
| 21  | 175°01.4'                        | S 20°50.2' | 203°44.4'                         | S 22°28.8' | 175°21.8'                        | S 21°56.7' | 72°56.6'                       | N 13°00.7' |
| 22  | 190°00.8'                        | S 20°50.0' | 218°46.4'                         | S 22°28.9' | 190°24.0'                        | S 21°56.6' | 87°57.5'                       | N 13°01.3' |
| 23  | 205°00.1'                        | S 20°49.8' | 233°48.5'                         | S 22°28.9' | 205°26.2'                        | S 21°56.6' | 102°58.3'                      | N 13°01.9' |

Tue Feb 19, 2019 UTC

| UTC | Venus -4.0         |            | Jupiter -1.8      |            | Saturn +0.6       |            | Mars +1.1         |            |
|-----|--------------------|------------|-------------------|------------|-------------------|------------|-------------------|------------|
|     | v = -0.7' d = 0.2' |            | v = 2.1' d = 0.0' |            | v = 2.2' d = 0.0' |            | v = 0.8' d = 0.6' |            |
|     | GHA                | dec        | GHA               | dec        | GHA               | dec        | GHA               | dec        |
| 0   | 219°59.4'          | S 20°49.6' | 248°50.6'         | S 22°28.9' | 220°28.4'         | S 21°56.6' | 117°59.2'         | N 13°02.6' |
| 1   | 234°58.8'          | S 20°49.3' | 263°52.7'         | S 22°28.9' | 235°30.6'         | S 21°56.6' | 133°00.0'         | N 13°03.2' |
| 2   | 249°58.1'          | S 20°49.1' | 278°54.8'         | S 22°29.0' | 250°32.8'         | S 21°56.5' | 148°00.9'         | N 13°03.8' |
| 3   | 264°57.5'          | S 20°48.9' | 293°56.9'         | S 22°29.0' | 265°35.0'         | S 21°56.5' | 163°01.7'         | N 13°04.4' |
| 4   | 279°56.8'          | S 20°48.7' | 308°59.0'         | S 22°29.0' | 280°37.2'         | S 21°56.5' | 178°02.6'         | N 13°05.0' |
| 5   | 294°56.1'          | S 20°48.5' | 324°01.1'         | S 22°29.0' | 295°39.4'         | S 21°56.5' | 193°03.4'         | N 13°05.6' |
| 6   | 309°55.5'          | S 20°48.3' | 339°03.2'         | S 22°29.0' | 310°41.6'         | S 21°56.4' | 208°04.3'         | N 13°06.2' |
| 7   | 324°54.8'          | S 20°48.1' | 354°05.3'         | S 22°29.1' | 325°43.9'         | S 21°56.4' | 223°05.1'         | N 13°06.8' |
| 8   | 339°54.2'          | S 20°47.8' | 9°07.3'           | S 22°29.1' | 340°46.1'         | S 21°56.4' | 238°06.0'         | N 13°07.4' |
| 9   | 354°53.5'          | S 20°47.6' | 24°09.4'          | S 22°29.1' | 355°48.3'         | S 21°56.3' | 253°06.8'         | N 13°08.0' |
| 10  | 9°52.8'            | S 20°47.4' | 39°11.5'          | S 22°29.1' | 10°50.5'          | S 21°56.3' | 268°07.6'         | N 13°08.6' |
| 11  | 24°52.2'           | S 20°47.2' | 54°13.6'          | S 22°29.2' | 25°52.7'          | S 21°56.3' | 283°08.5'         | N 13°09.2' |
| 12  | 39°51.5'           | S 20°46.9' | 69°15.7'          | S 22°29.2' | 40°54.9'          | S 21°56.3' | 298°09.3'         | N 13°09.8' |
| 13  | 54°50.9'           | S 20°46.7' | 84°17.8'          | S 22°29.2' | 55°57.1'          | S 21°56.2' | 313°10.2'         | N 13°10.4' |
| 14  | 69°50.2'           | S 20°46.5' | 99°19.9'          | S 22°29.2' | 70°59.3'          | S 21°56.2' | 328°11.0'         | N 13°11.0' |
| 15  | 84°49.6'           | S 20°46.3' | 114°22.0'         | S 22°29.3' | 86°01.5'          | S 21°56.2' | 343°11.9'         | N 13°11.6' |
| 16  | 99°48.9'           | S 20°46.0' | 129°24.1'         | S 22°29.3' | 101°03.7'         | S 21°56.1' | 358°12.7'         | N 13°12.2' |
| 17  | 114°48.2'          | S 20°45.8' | 144°26.2'         | S 22°29.3' | 116°05.9'         | S 21°56.1' | 13°13.6'          | N 13°12.8' |
| 18  | 129°47.6'          | S 20°45.6' | 159°28.3'         | S 22°29.3' | 131°08.1'         | S 21°56.1' | 28°14.4'          | N 13°13.4' |
| 19  | 144°46.9'          | S 20°45.4' | 174°30.4'         | S 22°29.4' | 146°10.3'         | S 21°56.1' | 43°15.3'          | N 13°14.0' |
| 20  | 159°46.3'          | S 20°45.1' | 189°32.4'         | S 22°29.4' | 161°12.5'         | S 21°56.0' | 58°16.1'          | N 13°14.6' |
| 21  | 174°45.6'          | S 20°44.9' | 204°34.5'         | S 22°29.4' | 176°14.8'         | S 21°56.0' | 73°17.0'          | N 13°15.2' |
| 22  | 189°44.9'          | S 20°44.7' | 219°36.6'         | S 22°29.4' | 191°17.0'         | S 21°56.0' | 88°17.8'          | N 13°15.8' |
| 23  | 204°44.3'          | S 20°44.4' | 234°38.7'         | S 22°29.4' | 206°19.2'         | S 21°55.9' | 103°18.6'         | N 13°16.4' |

Wed Feb 20, 2019 UTC

| UTC | Venus -4.0         |            | Jupiter -1.8      |            | Saturn +0.6       |            | Mars +1.1         |            |
|-----|--------------------|------------|-------------------|------------|-------------------|------------|-------------------|------------|
|     | v = -0.7' d = 0.2' |            | v = 2.1' d = 0.0' |            | v = 2.2' d = 0.0' |            | v = 0.8' d = 0.6' |            |
|     | GHA                | dec        | GHA               | dec        | GHA               | dec        | GHA               | dec        |
| 0   | 219°43.6'          | S 20°44.2' | 249°40.8'         | S 22°29.5' | 221°21.4'         | S 21°55.9' | 118°19.5'         | N 13°17.0' |
| 1   | 234°43.0'          | S 20°44.0' | 264°42.9'         | S 22°29.5' | 236°23.6'         | S 21°55.9' | 133°20.3'         | N 13°17.6' |
| 2   | 249°42.3'          | S 20°43.7' | 279°45.0'         | S 22°29.5' | 251°25.8'         | S 21°55.9' | 148°21.2'         | N 13°18.2' |
| 3   | 264°41.6'          | S 20°43.5' | 294°47.1'         | S 22°29.5' | 266°28.0'         | S 21°55.8' | 163°22.0'         | N 13°18.8' |
| 4   | 279°41.0'          | S 20°43.3' | 309°49.2'         | S 22°29.6' | 281°30.2'         | S 21°55.8' | 178°22.9'         | N 13°19.4' |
| 5   | 294°40.3'          | S 20°43.0' | 324°51.3'         | S 22°29.6' | 296°32.4'         | S 21°55.8' | 193°23.7'         | N 13°20.0' |
| 6   | 309°39.7'          | S 20°42.8' | 339°53.4'         | S 22°29.6' | 311°34.6'         | S 21°55.8' | 208°24.6'         | N 13°20.6' |
| 7   | 324°39.0'          | S 20°42.5' | 354°55.5'         | S 22°29.6' | 326°36.8'         | S 21°55.7' | 223°25.4'         | N 13°21.2' |
| 8   | 339°38.3'          | S 20°42.3' | 9°57.6'           | S 22°29.7' | 341°39.0'         | S 21°55.7' | 238°26.3'         | N 13°21.8' |
| 9   | 354°37.7'          | S 20°42.0' | 24°59.7'          | S 22°29.7' | 356°41.3'         | S 21°55.7' | 253°27.1'         | N 13°22.4' |
| 10  | 9°37.0'            | S 20°41.8' | 40°01.8'          | S 22°29.7' | 11°43.5'          | S 21°55.6' | 268°27.9'         | N 13°23.0' |
| 11  | 24°36.4'           | S 20°41.6' | 55°03.9'          | S 22°29.7' | 26°45.7'          | S 21°55.6' | 283°28.8'         | N 13°23.6' |
| 12  | 39°35.7'           | S 20°41.3' | 70°06.0'          | S 22°29.8' | 41°47.9'          | S 21°55.6' | 298°29.6'         | N 13°24.2' |
| 13  | 54°35.0'           | S 20°41.1' | 85°08.1'          | S 22°29.8' | 56°50.1'          | S 21°55.6' | 313°30.5'         | N 13°24.8' |
| 14  | 69°34.4'           | S 20°40.8' | 100°10.2'         | S 22°29.8' | 71°52.3'          | S 21°55.5' | 328°31.3'         | N 13°25.4' |
| 15  | 84°33.7'           | S 20°40.6' | 115°12.3'         | S 22°29.8' | 86°54.5'          | S 21°55.5' | 343°32.2'         | N 13°26.0' |
| 16  | 99°33.1'           | S 20°40.3' | 130°14.4'         | S 22°29.8' | 101°56.7'         | S 21°55.5' | 358°33.0'         | N 13°26.6' |
| 17  | 114°32.4'          | S 20°40.1' | 145°16.5'         | S 22°29.9' | 116°58.9'         | S 21°55.4' | 13°33.8'          | N 13°27.2' |
| 18  | 129°31.7'          | S 20°39.8' | 160°18.6'         | S 22°29.9' | 132°01.1'         | S 21°55.4' | 28°34.7'          | N 13°27.8' |
| 19  | 144°31.1'          | S 20°39.6' | 175°20.7'         | S 22°29.9' | 147°03.4'         | S 21°55.4' | 43°35.5'          | N 13°28.4' |
| 20  | 159°30.4'          | S 20°39.3' | 190°22.8'         | S 22°29.9' | 162°05.6'         | S 21°55.4' | 58°36.4'          | N 13°29.0' |
| 21  | 174°29.8'          | S 20°39.0' | 205°24.9'         | S 22°30.0' | 177°07.8'         | S 21°55.3' | 73°37.2'          | N 13°29.6' |
| 22  | 189°29.1'          | S 20°38.8' | 220°27.0'         | S 22°30.0' | 192°10.0'         | S 21°55.3' | 88°38.1'          | N 13°30.2' |
| 23  | 204°28.5'          | S 20°38.5' | 235°29.1'         | S 22°30.0' | 207°12.2'         | S 21°55.3' | 103°38.9'         | N 13°30.8' |

Thu Feb 21, 2019 UTC

| UTC | Venus -4.0<br>v = -0.7' d = 0.3' |            | Jupiter -1.8<br>v = 2.1' d = 0.0' |            | Saturn +0.6<br>v = 2.2' d = 0.0' |            | Mars +1.1<br>v = 0.8' d = 0.6' |            |
|-----|----------------------------------|------------|-----------------------------------|------------|----------------------------------|------------|--------------------------------|------------|
|     | GHA                              | dec        | GHA                               | dec        | GHA                              | dec        | GHA                            | dec        |
| 0   | 219°27.8'                        | S 20°38.3' | 250°31.2'                         | S 22°30.0' | 222°14.4'                        | S 21°55.3' | 118°39.7'                      | N 13°31.4' |
| 1   | 234°27.1'                        | S 20°38.0' | 265°33.3'                         | S 22°30.0' | 237°16.6'                        | S 21°55.2' | 133°40.6'                      | N 13°32.0' |
| 2   | 249°26.5'                        | S 20°37.7' | 280°35.4'                         | S 22°30.1' | 252°18.8'                        | S 21°55.2' | 148°41.4'                      | N 13°32.6' |
| 3   | 264°25.8'                        | S 20°37.5' | 295°37.5'                         | S 22°30.1' | 267°21.0'                        | S 21°55.2' | 163°42.3'                      | N 13°33.2' |
| 4   | 279°25.2'                        | S 20°37.2' | 310°39.6'                         | S 22°30.1' | 282°23.3'                        | S 21°55.1' | 178°43.1'                      | N 13°33.8' |
| 5   | 294°24.5'                        | S 20°37.0' | 325°41.7'                         | S 22°30.1' | 297°25.5'                        | S 21°55.1' | 193°44.0'                      | N 13°34.4' |
| 6   | 309°23.8'                        | S 20°36.7' | 340°43.8'                         | S 22°30.2' | 312°27.7'                        | S 21°55.1' | 208°44.8'                      | N 13°35.0' |
| 7   | 324°23.2'                        | S 20°36.4' | 355°45.9'                         | S 22°30.2' | 327°29.9'                        | S 21°55.1' | 223°45.6'                      | N 13°35.6' |
| 8   | 339°22.5'                        | S 20°36.2' | 10°48.0'                          | S 22°30.2' | 342°32.1'                        | S 21°55.0' | 238°46.5'                      | N 13°36.2' |
| 9   | 354°21.9'                        | S 20°35.9' | 25°50.1'                          | S 22°30.2' | 357°34.3'                        | S 21°55.0' | 253°47.3'                      | N 13°36.8' |
| 10  | 9°21.2'                          | S 20°35.6' | 40°52.2'                          | S 22°30.2' | 12°36.5'                         | S 21°55.0' | 268°48.2'                      | N 13°37.4' |
| 11  | 24°20.5'                         | S 20°35.4' | 55°54.3'                          | S 22°30.3' | 27°38.7'                         | S 21°54.9' | 283°49.0'                      | N 13°38.0' |
| 12  | 39°19.9'                         | S 20°35.1' | 70°56.4'                          | S 22°30.3' | 42°40.9'                         | S 21°54.9' | 298°49.9'                      | N 13°38.6' |
| 13  | 54°19.2'                         | S 20°34.8' | 85°58.5'                          | S 22°30.3' | 57°43.2'                         | S 21°54.9' | 313°50.7'                      | N 13°39.2' |
| 14  | 69°18.6'                         | S 20°34.5' | 101°00.6'                         | S 22°30.3' | 72°45.4'                         | S 21°54.9' | 328°51.5'                      | N 13°39.7' |
| 15  | 84°17.9'                         | S 20°34.3' | 116°02.7'                         | S 22°30.4' | 87°47.6'                         | S 21°54.8' | 343°52.4'                      | N 13°40.3' |
| 16  | 99°17.2'                         | S 20°34.0' | 131°04.8'                         | S 22°30.4' | 102°49.8'                        | S 21°54.8' | 358°53.2'                      | N 13°40.9' |
| 17  | 114°16.6'                        | S 20°33.7' | 146°06.9'                         | S 22°30.4' | 117°52.0'                        | S 21°54.8' | 13°54.1'                       | N 13°41.5' |
| 18  | 129°15.9'                        | S 20°33.4' | 161°09.0'                         | S 22°30.4' | 132°54.2'                        | S 21°54.8' | 28°54.9'                       | N 13°42.1' |
| 19  | 144°15.3'                        | S 20°33.2' | 176°11.1'                         | S 22°30.4' | 147°56.4'                        | S 21°54.7' | 43°55.7'                       | N 13°42.7' |
| 20  | 159°14.6'                        | S 20°32.9' | 191°13.2'                         | S 22°30.5' | 162°58.6'                        | S 21°54.7' | 58°56.6'                       | N 13°43.3' |
| 21  | 174°14.0'                        | S 20°32.6' | 206°15.3'                         | S 22°30.5' | 178°00.9'                        | S 21°54.7' | 73°57.4'                       | N 13°43.9' |
| 22  | 189°13.3'                        | S 20°32.3' | 221°17.4'                         | S 22°30.5' | 193°03.1'                        | S 21°54.6' | 88°58.3'                       | N 13°44.5' |
| 23  | 204°12.6'                        | S 20°32.0' | 236°19.5'                         | S 22°30.5' | 208°05.3'                        | S 21°54.6' | 103°59.1'                      | N 13°45.1' |

Fri Feb 22, 2019 UTC

| UTC | Venus -4.0<br>v = -0.7' d = 0.3' |            | Jupiter -1.8<br>v = 2.1' d = 0.0' |            | Saturn +0.6<br>v = 2.2' d = 0.0' |            | Mars +1.1<br>v = 0.8' d = 0.6' |            |
|-----|----------------------------------|------------|-----------------------------------|------------|----------------------------------|------------|--------------------------------|------------|
|     | GHA                              | dec        | GHA                               | dec        | GHA                              | dec        | GHA                            | dec        |
| 0   | 219°12.0'                        | S 20°31.8' | 251°21.6'                         | S 22°30.6' | 223°07.5'                        | S 21°54.6' | 118°59.9'                      | N 13°45.7' |
| 1   | 234°11.3'                        | S 20°31.5' | 266°23.7'                         | S 22°30.6' | 238°09.7'                        | S 21°54.6' | 134°00.8'                      | N 13°46.3' |
| 2   | 249°10.7'                        | S 20°31.2' | 281°25.8'                         | S 22°30.6' | 253°11.9'                        | S 21°54.5' | 149°01.6'                      | N 13°46.9' |
| 3   | 264°10.0'                        | S 20°30.9' | 296°27.9'                         | S 22°30.6' | 268°14.1'                        | S 21°54.5' | 164°02.5'                      | N 13°47.5' |
| 4   | 279°09.3'                        | S 20°30.6' | 311°30.0'                         | S 22°30.6' | 283°16.4'                        | S 21°54.5' | 179°03.3'                      | N 13°48.0' |
| 5   | 294°08.7'                        | S 20°30.3' | 326°32.2'                         | S 22°30.7' | 298°18.6'                        | S 21°54.4' | 194°04.1'                      | N 13°48.6' |
| 6   | 309°08.0'                        | S 20°30.0' | 341°34.3'                         | S 22°30.7' | 313°20.8'                        | S 21°54.4' | 209°05.0'                      | N 13°49.2' |
| 7   | 324°07.4'                        | S 20°29.7' | 356°36.4'                         | S 22°30.7' | 328°23.0'                        | S 21°54.4' | 224°05.8'                      | N 13°49.8' |
| 8   | 339°06.7'                        | S 20°29.5' | 11°38.5'                          | S 22°30.7' | 343°25.2'                        | S 21°54.4' | 239°06.7'                      | N 13°50.4' |
| 9   | 354°06.0'                        | S 20°29.2' | 26°40.6'                          | S 22°30.8' | 358°27.4'                        | S 21°54.3' | 254°07.5'                      | N 13°51.0' |
| 10  | 9°05.4'                          | S 20°28.9' | 41°42.7'                          | S 22°30.8' | 13°29.6'                         | S 21°54.3' | 269°08.3'                      | N 13°51.6' |
| 11  | 24°04.7'                         | S 20°28.6' | 56°44.8'                          | S 22°30.8' | 28°31.9'                         | S 21°54.3' | 284°09.2'                      | N 13°52.2' |
| 12  | 39°04.1'                         | S 20°28.3' | 71°46.9'                          | S 22°30.8' | 43°34.1'                         | S 21°54.3' | 299°10.0'                      | N 13°52.8' |
| 13  | 54°03.4'                         | S 20°28.0' | 86°49.0'                          | S 22°30.8' | 58°36.3'                         | S 21°54.2' | 314°10.8'                      | N 13°53.4' |
| 14  | 69°02.8'                         | S 20°27.7' | 101°51.1'                         | S 22°30.9' | 73°38.5'                         | S 21°54.2' | 329°11.7'                      | N 13°53.9' |
| 15  | 84°02.1'                         | S 20°27.4' | 116°53.2'                         | S 22°30.9' | 88°40.7'                         | S 21°54.2' | 344°12.5'                      | N 13°54.5' |
| 16  | 99°01.4'                         | S 20°27.1' | 131°55.3'                         | S 22°30.9' | 103°42.9'                        | S 21°54.1' | 359°13.4'                      | N 13°55.1' |
| 17  | 114°00.8'                        | S 20°26.8' | 146°57.5'                         | S 22°30.9' | 118°45.1'                        | S 21°54.1' | 14°14.2'                       | N 13°55.7' |
| 18  | 129°00.1'                        | S 20°26.5' | 161°59.6'                         | S 22°30.9' | 133°47.4'                        | S 21°54.1' | 29°15.0'                       | N 13°56.3' |
| 19  | 143°59.5'                        | S 20°26.2' | 177°01.7'                         | S 22°31.0' | 148°49.6'                        | S 21°54.1' | 44°15.9'                       | N 13°56.9' |
| 20  | 158°58.8'                        | S 20°25.9' | 192°03.8'                         | S 22°31.0' | 163°51.8'                        | S 21°54.0' | 59°16.7'                       | N 13°57.5' |
| 21  | 173°58.1'                        | S 20°25.6' | 207°05.9'                         | S 22°31.0' | 178°54.0'                        | S 21°54.0' | 74°17.6'                       | N 13°58.1' |
| 22  | 188°57.5'                        | S 20°25.3' | 222°08.0'                         | S 22°31.0' | 193°56.2'                        | S 21°54.0' | 89°18.4'                       | N 13°58.7' |
| 23  | 203°56.8'                        | S 20°25.0' | 237°10.1'                         | S 22°31.1' | 208°58.4'                        | S 21°53.9' | 104°19.2'                      | N 13°59.2' |

Sat Feb 23, 2019 UTC

| UTC | Venus -4.0         |            | Jupiter -1.9      |            | Saturn +0.6       |            | Mars +1.1         |            |
|-----|--------------------|------------|-------------------|------------|-------------------|------------|-------------------|------------|
|     | v = -0.7' d = 0.3' |            | v = 2.1' d = 0.0' |            | v = 2.2' d = 0.0' |            | v = 0.8' d = 0.6' |            |
|     | GHA                | dec        | GHA               | dec        | GHA               | dec        | GHA               | dec        |
| 0   | 218°56.2'          | S 20°24.7' | 252°12.2'         | S 22°31.1' | 224°00.6'         | S 21°53.9' | 119°20.1'         | N 13°59.8' |
| 1   | 233°55.5'          | S 20°24.4' | 267°14.3'         | S 22°31.1' | 239°02.9'         | S 21°53.9' | 134°20.9'         | N 14°00.4' |
| 2   | 248°54.9'          | S 20°24.0' | 282°16.5'         | S 22°31.1' | 254°05.1'         | S 21°53.9' | 149°21.7'         | N 14°01.0' |
| 3   | 263°54.2'          | S 20°23.7' | 297°18.6'         | S 22°31.1' | 269°07.3'         | S 21°53.8' | 164°22.6'         | N 14°01.6' |
| 4   | 278°53.5'          | S 20°23.4' | 312°20.7'         | S 22°31.2' | 284°09.5'         | S 21°53.8' | 179°23.4'         | N 14°02.2' |
| 5   | 293°52.9'          | S 20°23.1' | 327°22.8'         | S 22°31.2' | 299°11.7'         | S 21°53.8' | 194°24.3'         | N 14°02.8' |
| 6   | 308°52.2'          | S 20°22.8' | 342°24.9'         | S 22°31.2' | 314°13.9'         | S 21°53.8' | 209°25.1'         | N 14°03.4' |
| 7   | 323°51.6'          | S 20°22.5' | 357°27.0'         | S 22°31.2' | 329°16.2'         | S 21°53.7' | 224°25.9'         | N 14°03.9' |
| 8   | 338°50.9'          | S 20°22.2' | 12°29.1'          | S 22°31.2' | 344°18.4'         | S 21°53.7' | 239°26.8'         | N 14°04.5' |
| 9   | 353°50.3'          | S 20°21.9' | 27°31.2'          | S 22°31.3' | 359°20.6'         | S 21°53.7' | 254°27.6'         | N 14°05.1' |
| 10  | 8°49.6'            | S 20°21.5' | 42°33.4'          | S 22°31.3' | 14°22.8'          | S 21°53.6' | 269°28.4'         | N 14°05.7' |
| 11  | 23°48.9'           | S 20°21.2' | 57°35.5'          | S 22°31.3' | 29°25.0'          | S 21°53.6' | 284°29.3'         | N 14°06.3' |
| 12  | 38°48.3'           | S 20°20.9' | 72°37.6'          | S 22°31.3' | 44°27.2'          | S 21°53.6' | 299°30.1'         | N 14°06.9' |
| 13  | 53°47.6'           | S 20°20.6' | 87°39.7'          | S 22°31.3' | 59°29.5'          | S 21°53.6' | 314°30.9'         | N 14°07.5' |
| 14  | 68°47.0'           | S 20°20.3' | 102°41.8'         | S 22°31.4' | 74°31.7'          | S 21°53.5' | 329°31.8'         | N 14°08.0' |
| 15  | 83°46.3'           | S 20°19.9' | 117°43.9'         | S 22°31.4' | 89°33.9'          | S 21°53.5' | 344°32.6'         | N 14°08.6' |
| 16  | 98°45.7'           | S 20°19.6' | 132°46.1'         | S 22°31.4' | 104°36.1'         | S 21°53.5' | 359°33.4'         | N 14°09.2' |
| 17  | 113°45.0'          | S 20°19.3' | 147°48.2'         | S 22°31.4' | 119°38.3'         | S 21°53.5' | 14°34.3'          | N 14°09.8' |
| 18  | 128°44.3'          | S 20°19.0' | 162°50.3'         | S 22°31.4' | 134°40.6'         | S 21°53.4' | 29°35.1'          | N 14°10.4' |
| 19  | 143°43.7'          | S 20°18.6' | 177°52.4'         | S 22°31.5' | 149°42.8'         | S 21°53.4' | 44°36.0'          | N 14°11.0' |
| 20  | 158°43.0'          | S 20°18.3' | 192°54.5'         | S 22°31.5' | 164°45.0'         | S 21°53.4' | 59°36.8'          | N 14°11.5' |
| 21  | 173°42.4'          | S 20°18.0' | 207°56.6'         | S 22°31.5' | 179°47.2'         | S 21°53.3' | 74°37.6'          | N 14°12.1' |
| 22  | 188°41.7'          | S 20°17.7' | 222°58.8'         | S 22°31.5' | 194°49.4'         | S 21°53.3' | 89°38.5'          | N 14°12.7' |
| 23  | 203°41.1'          | S 20°17.3' | 238°00.9'         | S 22°31.5' | 209°51.6'         | S 21°53.3' | 104°39.3'         | N 14°13.3' |

Sun Feb 24, 2019 UTC

| UTC | Venus -4.0         |            | Jupiter -1.9      |            | Saturn +0.6       |            | Mars +1.1         |            |
|-----|--------------------|------------|-------------------|------------|-------------------|------------|-------------------|------------|
|     | v = -0.7' d = 0.3' |            | v = 2.1' d = 0.0' |            | v = 2.2' d = 0.0' |            | v = 0.8' d = 0.6' |            |
|     | GHA                | dec        | GHA               | dec        | GHA               | dec        | GHA               | dec        |
| 0   | 218°40.4'          | S 20°17.0' | 253°03.0'         | S 22°31.6' | 224°53.9'         | S 21°53.3' | 119°40.1'         | N 14°13.9' |
| 1   | 233°39.7'          | S 20°16.7' | 268°05.1'         | S 22°31.6' | 239°56.1'         | S 21°53.2' | 134°41.0'         | N 14°14.5' |
| 2   | 248°39.1'          | S 20°16.3' | 283°07.2'         | S 22°31.6' | 254°58.3'         | S 21°53.2' | 149°41.8'         | N 14°15.0' |
| 3   | 263°38.4'          | S 20°16.0' | 298°09.3'         | S 22°31.6' | 270°00.5'         | S 21°53.2' | 164°42.6'         | N 14°15.6' |
| 4   | 278°37.8'          | S 20°15.7' | 313°11.5'         | S 22°31.7' | 285°02.7'         | S 21°53.1' | 179°43.5'         | N 14°16.2' |
| 5   | 293°37.1'          | S 20°15.3' | 328°13.6'         | S 22°31.7' | 300°05.0'         | S 21°53.1' | 194°44.3'         | N 14°16.8' |
| 6   | 308°36.5'          | S 20°15.0' | 343°15.7'         | S 22°31.7' | 315°07.2'         | S 21°53.1' | 209°45.1'         | N 14°17.4' |
| 7   | 323°35.8'          | S 20°14.7' | 358°17.8'         | S 22°31.7' | 330°09.4'         | S 21°53.1' | 224°46.0'         | N 14°17.9' |
| 8   | 338°35.2'          | S 20°14.3' | 13°19.9'          | S 22°31.7' | 345°11.6'         | S 21°53.0' | 239°46.8'         | N 14°18.5' |
| 9   | 353°34.5'          | S 20°14.0' | 28°22.1'          | S 22°31.8' | 0°13.8'           | S 21°53.0' | 254°47.6'         | N 14°19.1' |
| 10  | 8°33.8'            | S 20°13.6' | 43°24.2'          | S 22°31.8' | 15°16.1'          | S 21°53.0' | 269°48.5'         | N 14°19.7' |
| 11  | 23°33.2'           | S 20°13.3' | 58°26.3'          | S 22°31.8' | 30°18.3'          | S 21°53.0' | 284°49.3'         | N 14°20.3' |
| 12  | 38°32.5'           | S 20°12.9' | 73°28.4'          | S 22°31.8' | 45°20.5'          | S 21°52.9' | 299°50.1'         | N 14°20.8' |
| 13  | 53°31.9'           | S 20°12.6' | 88°30.5'          | S 22°31.8' | 60°22.7'          | S 21°52.9' | 314°51.0'         | N 14°21.4' |
| 14  | 68°31.2'           | S 20°12.3' | 103°32.7'         | S 22°31.9' | 75°24.9'          | S 21°52.9' | 329°51.8'         | N 14°22.0' |
| 15  | 83°30.6'           | S 20°11.9' | 118°34.8'         | S 22°31.9' | 90°27.2'          | S 21°52.8' | 344°52.6'         | N 14°22.6' |
| 16  | 98°29.9'           | S 20°11.6' | 133°36.9'         | S 22°31.9' | 105°29.4'         | S 21°52.8' | 359°53.5'         | N 14°23.2' |
| 17  | 113°29.3'          | S 20°11.2' | 148°39.0'         | S 22°31.9' | 120°31.6'         | S 21°52.8' | 14°54.3'          | N 14°23.7' |
| 18  | 128°28.6'          | S 20°10.9' | 163°41.1'         | S 22°31.9' | 135°33.8'         | S 21°52.8' | 29°55.1'          | N 14°24.3' |
| 19  | 143°28.0'          | S 20°10.5' | 178°43.3'         | S 22°32.0' | 150°36.0'         | S 21°52.7' | 44°56.0'          | N 14°24.9' |
| 20  | 158°27.3'          | S 20°10.2' | 193°45.4'         | S 22°32.0' | 165°38.3'         | S 21°52.7' | 59°56.8'          | N 14°25.5' |
| 21  | 173°26.6'          | S 20°09.8' | 208°47.5'         | S 22°32.0' | 180°40.5'         | S 21°52.7' | 74°57.6'          | N 14°26.1' |
| 22  | 188°26.0'          | S 20°09.5' | 223°49.6'         | S 22°32.0' | 195°42.7'         | S 21°52.7' | 89°58.5'          | N 14°26.6' |
| 23  | 203°25.3'          | S 20°09.1' | 238°51.8'         | S 22°32.0' | 210°44.9'         | S 21°52.6' | 104°59.3'         | N 14°27.2' |

Mon Feb 25, 2019 UTC

| UTC | Venus -4.0         |            | Jupiter -1.9      |            | Saturn +0.6       |            | Mars +1.1         |            |
|-----|--------------------|------------|-------------------|------------|-------------------|------------|-------------------|------------|
|     | v = -0.7' d = 0.4' |            | v = 2.1' d = 0.0' |            | v = 2.2' d = 0.0' |            | v = 0.8' d = 0.6' |            |
|     | GHA                | dec        | GHA               | dec        | GHA               | dec        | GHA               | dec        |
| 0   | 218°24.7'          | S 20°08.8' | 253°53.9'         | S 22°32.1' | 225°47.1'         | S 21°52.6' | 120°00.1'         | N 14°27.8' |
| 1   | 233°24.0'          | S 20°08.4' | 268°56.0'         | S 22°32.1' | 240°49.4'         | S 21°52.6' | 135°01.0'         | N 14°28.4' |
| 2   | 248°23.4'          | S 20°08.0' | 283°58.1'         | S 22°32.1' | 255°51.6'         | S 21°52.5' | 150°01.8'         | N 14°28.9' |
| 3   | 263°22.7'          | S 20°07.7' | 299°00.3'         | S 22°32.1' | 270°53.8'         | S 21°52.5' | 165°02.6'         | N 14°29.5' |
| 4   | 278°22.1'          | S 20°07.3' | 314°02.4'         | S 22°32.1' | 285°56.0'         | S 21°52.5' | 180°03.4'         | N 14°30.1' |
| 5   | 293°21.4'          | S 20°07.0' | 329°04.5'         | S 22°32.2' | 300°58.2'         | S 21°52.5' | 195°04.3'         | N 14°30.7' |
| 6   | 308°20.8'          | S 20°06.6' | 344°06.6'         | S 22°32.2' | 316°00.5'         | S 21°52.4' | 210°05.1'         | N 14°31.3' |
| 7   | 323°20.1'          | S 20°06.2' | 359°08.8'         | S 22°32.2' | 331°02.7'         | S 21°52.4' | 225°05.9'         | N 14°31.8' |
| 8   | 338°19.4'          | S 20°05.9' | 14°10.9'          | S 22°32.2' | 346°04.9'         | S 21°52.4' | 240°06.8'         | N 14°32.4' |
| 9   | 353°18.8'          | S 20°05.5' | 29°13.0'          | S 22°32.2' | 1°07.1'           | S 21°52.4' | 255°07.6'         | N 14°33.0' |
| 10  | 8°18.1'            | S 20°05.2' | 44°15.1'          | S 22°32.2' | 16°09.4'          | S 21°52.3' | 270°08.4'         | N 14°33.6' |
| 11  | 23°17.5'           | S 20°04.8' | 59°17.3'          | S 22°32.3' | 31°11.6'          | S 21°52.3' | 285°09.3'         | N 14°34.1' |
| 12  | 38°16.8'           | S 20°04.4' | 74°19.4'          | S 22°32.3' | 46°13.8'          | S 21°52.3' | 300°10.1'         | N 14°34.7' |
| 13  | 53°16.2'           | S 20°04.1' | 89°21.5'          | S 22°32.3' | 61°16.0'          | S 21°52.2' | 315°10.9'         | N 14°35.3' |
| 14  | 68°15.5'           | S 20°03.7' | 104°23.6'         | S 22°32.3' | 76°18.2'          | S 21°52.2' | 330°11.8'         | N 14°35.9' |
| 15  | 83°14.9'           | S 20°03.3' | 119°25.8'         | S 22°32.3' | 91°20.5'          | S 21°52.2' | 345°12.6'         | N 14°36.4' |
| 16  | 98°14.2'           | S 20°02.9' | 134°27.9'         | S 22°32.4' | 106°22.7'         | S 21°52.2' | 0°13.4'           | N 14°37.0' |
| 17  | 113°13.6'          | S 20°02.6' | 149°30.0'         | S 22°32.4' | 121°24.9'         | S 21°52.1' | 15°14.2'          | N 14°37.6' |
| 18  | 128°12.9'          | S 20°02.2' | 164°32.2'         | S 22°32.4' | 136°27.1'         | S 21°52.1' | 30°15.1'          | N 14°38.2' |
| 19  | 143°12.3'          | S 20°01.8' | 179°34.3'         | S 22°32.4' | 151°29.4'         | S 21°52.1' | 45°15.9'          | N 14°38.7' |
| 20  | 158°11.6'          | S 20°01.5' | 194°36.4'         | S 22°32.4' | 166°31.6'         | S 21°52.1' | 60°16.7'          | N 14°39.3' |
| 21  | 173°11.0'          | S 20°01.1' | 209°38.5'         | S 22°32.5' | 181°33.8'         | S 21°52.0' | 75°17.6'          | N 14°39.9' |
| 22  | 188°10.3'          | S 20°00.7' | 224°40.7'         | S 22°32.5' | 196°36.0'         | S 21°52.0' | 90°18.4'          | N 14°40.5' |
| 23  | 203°09.7'          | S 20°00.3' | 239°42.8'         | S 22°32.5' | 211°38.3'         | S 21°52.0' | 105°19.2'         | N 14°41.0' |

Tue Feb 26, 2019 UTC

| UTC | Venus -4.0         |            | Jupiter -1.9      |            | Saturn +0.6       |            | Mars +1.2         |            |
|-----|--------------------|------------|-------------------|------------|-------------------|------------|-------------------|------------|
|     | v = -0.7' d = 0.4' |            | v = 2.1' d = 0.0' |            | v = 2.2' d = 0.0' |            | v = 0.8' d = 0.6' |            |
|     | GHA                | dec        | GHA               | dec        | GHA               | dec        | GHA               | dec        |
| 0   | 218°09.0'          | S 19°59.9' | 254°44.9'         | S 22°32.5' | 226°40.5'         | S 21°51.9' | 120°20.0'         | N 14°41.6' |
| 1   | 233°08.4'          | S 19°59.6' | 269°47.1'         | S 22°32.5' | 241°42.7'         | S 21°51.9' | 135°20.9'         | N 14°42.2' |
| 2   | 248°07.7'          | S 19°59.2' | 284°49.2'         | S 22°32.6' | 256°44.9'         | S 21°51.9' | 150°21.7'         | N 14°42.7' |
| 3   | 263°07.1'          | S 19°58.8' | 299°51.3'         | S 22°32.6' | 271°47.2'         | S 21°51.9' | 165°22.5'         | N 14°43.3' |
| 4   | 278°06.4'          | S 19°58.4' | 314°53.5'         | S 22°32.6' | 286°49.4'         | S 21°51.8' | 180°23.4'         | N 14°43.9' |
| 5   | 293°05.7'          | S 19°58.0' | 329°55.6'         | S 22°32.6' | 301°51.6'         | S 21°51.8' | 195°24.2'         | N 14°44.5' |
| 6   | 308°05.1'          | S 19°57.7' | 344°57.7'         | S 22°32.6' | 316°53.8'         | S 21°51.8' | 210°25.0'         | N 14°45.0' |
| 7   | 323°04.4'          | S 19°57.3' | 359°59.8'         | S 22°32.7' | 331°56.0'         | S 21°51.8' | 225°25.8'         | N 14°45.6' |
| 8   | 338°03.8'          | S 19°56.9' | 15°02.0'          | S 22°32.7' | 346°58.3'         | S 21°51.7' | 240°26.7'         | N 14°46.2' |
| 9   | 353°03.1'          | S 19°56.5' | 30°04.1'          | S 22°32.7' | 2°00.5'           | S 21°51.7' | 255°27.5'         | N 14°46.7' |
| 10  | 8°02.5'            | S 19°56.1' | 45°06.2'          | S 22°32.7' | 17°02.7'          | S 21°51.7' | 270°28.3'         | N 14°47.3' |
| 11  | 23°01.8'           | S 19°55.7' | 60°08.4'          | S 22°32.7' | 32°04.9'          | S 21°51.6' | 285°29.2'         | N 14°47.9' |
| 12  | 38°01.2'           | S 19°55.3' | 75°10.5'          | S 22°32.7' | 47°07.2'          | S 21°51.6' | 300°30.0'         | N 14°48.5' |
| 13  | 53°00.5'           | S 19°54.9' | 90°12.6'          | S 22°32.8' | 62°09.4'          | S 21°51.6' | 315°30.8'         | N 14°49.0' |
| 14  | 67°59.9'           | S 19°54.5' | 105°14.8'         | S 22°32.8' | 77°11.6'          | S 21°51.6' | 330°31.6'         | N 14°49.6' |
| 15  | 82°59.2'           | S 19°54.1' | 120°16.9'         | S 22°32.8' | 92°13.9'          | S 21°51.5' | 345°32.5'         | N 14°50.2' |
| 16  | 97°58.6'           | S 19°53.8' | 135°19.0'         | S 22°32.8' | 107°16.1'         | S 21°51.5' | 0°33.3'           | N 14°50.7' |
| 17  | 112°57.9'          | S 19°53.4' | 150°21.2'         | S 22°32.8' | 122°18.3'         | S 21°51.5' | 15°34.1'          | N 14°51.3' |
| 18  | 127°57.3'          | S 19°53.0' | 165°23.3'         | S 22°32.9' | 137°20.5'         | S 21°51.5' | 30°34.9'          | N 14°51.9' |
| 19  | 142°56.6'          | S 19°52.6' | 180°25.4'         | S 22°32.9' | 152°22.8'         | S 21°51.4' | 45°35.8'          | N 14°52.4' |
| 20  | 157°56.0'          | S 19°52.2' | 195°27.6'         | S 22°32.9' | 167°25.0'         | S 21°51.4' | 60°36.6'          | N 14°53.0' |
| 21  | 172°55.3'          | S 19°51.8' | 210°29.7'         | S 22°32.9' | 182°27.2'         | S 21°51.4' | 75°37.4'          | N 14°53.6' |
| 22  | 187°54.7'          | S 19°51.4' | 225°31.9'         | S 22°32.9' | 197°29.4'         | S 21°51.3' | 90°38.3'          | N 14°54.2' |
| 23  | 202°54.0'          | S 19°51.0' | 240°34.0'         | S 22°32.9' | 212°31.7'         | S 21°51.3' | 105°39.1'         | N 14°54.7' |

Wed Feb 27, 2019 UTC

| UTC | Venus -4.0         |            | Jupiter -1.9      |            | Saturn +0.6       |            | Mars +1.2         |            |
|-----|--------------------|------------|-------------------|------------|-------------------|------------|-------------------|------------|
|     | v = -0.6' d = 0.4' |            | v = 2.1' d = 0.0' |            | v = 2.2' d = 0.0' |            | v = 0.8' d = 0.6' |            |
|     | GHA                | dec        | GHA               | dec        | GHA               | dec        | GHA               | dec        |
| 0   | 217°53.4'          | S 19°50.6' | 255°36.1'         | S 22°33.0' | 227°33.9'         | S 21°51.3' | 120°39.9'         | N 14°55.3' |
| 1   | 232°52.8'          | S 19°50.2' | 270°38.3'         | S 22°33.0' | 242°36.1'         | S 21°51.3' | 135°40.7'         | N 14°55.9' |
| 2   | 247°52.1'          | S 19°49.8' | 285°40.4'         | S 22°33.0' | 257°38.3'         | S 21°51.2' | 150°41.6'         | N 14°56.4' |
| 3   | 262°51.5'          | S 19°49.3' | 300°42.5'         | S 22°33.0' | 272°40.6'         | S 21°51.2' | 165°42.4'         | N 14°57.0' |
| 4   | 277°50.8'          | S 19°48.9' | 315°44.7'         | S 22°33.0' | 287°42.8'         | S 21°51.2' | 180°43.2'         | N 14°57.6' |
| 5   | 292°50.2'          | S 19°48.5' | 330°46.8'         | S 22°33.1' | 302°45.0'         | S 21°51.2' | 195°44.0'         | N 14°58.1' |
| 6   | 307°49.5'          | S 19°48.1' | 345°48.9'         | S 22°33.1' | 317°47.2'         | S 21°51.1' | 210°44.9'         | N 14°58.7' |
| 7   | 322°48.9'          | S 19°47.7' | 0°51.1'           | S 22°33.1' | 332°49.5'         | S 21°51.1' | 225°45.7'         | N 14°59.3' |
| 8   | 337°48.2'          | S 19°47.3' | 15°53.2'          | S 22°33.1' | 347°51.7'         | S 21°51.1' | 240°46.5'         | N 14°59.8' |
| 9   | 352°47.6'          | S 19°46.9' | 30°55.4'          | S 22°33.1' | 2°53.9'           | S 21°51.1' | 255°47.3'         | N 15°00.4' |
| 10  | 7°46.9'            | S 19°46.5' | 45°57.5'          | S 22°33.2' | 17°56.2'          | S 21°51.0' | 270°48.2'         | N 15°01.0' |
| 11  | 22°46.3'           | S 19°46.1' | 60°59.6'          | S 22°33.2' | 32°58.4'          | S 21°51.0' | 285°49.0'         | N 15°01.5' |
| 12  | 37°45.6'           | S 19°45.7' | 76°01.8'          | S 22°33.2' | 48°00.6'          | S 21°51.0' | 300°49.8'         | N 15°02.1' |
| 13  | 52°45.0'           | S 19°45.2' | 91°03.9'          | S 22°33.2' | 63°02.8'          | S 21°50.9' | 315°50.6'         | N 15°02.7' |
| 14  | 67°44.3'           | S 19°44.8' | 106°06.1'         | S 22°33.2' | 78°05.1'          | S 21°50.9' | 330°51.5'         | N 15°03.2' |
| 15  | 82°43.7'           | S 19°44.4' | 121°08.2'         | S 22°33.2' | 93°07.3'          | S 21°50.9' | 345°52.3'         | N 15°03.8' |
| 16  | 97°43.0'           | S 19°44.0' | 136°10.3'         | S 22°33.3' | 108°09.5'         | S 21°50.9' | 0°53.1'           | N 15°04.3' |
| 17  | 112°42.4'          | S 19°43.6' | 151°12.5'         | S 22°33.3' | 123°11.8'         | S 21°50.8' | 15°53.9'          | N 15°04.9' |
| 18  | 127°41.7'          | S 19°43.2' | 166°14.6'         | S 22°33.3' | 138°14.0'         | S 21°50.8' | 30°54.7'          | N 15°05.5' |
| 19  | 142°41.1'          | S 19°42.7' | 181°16.8'         | S 22°33.3' | 153°16.2'         | S 21°50.8' | 45°55.6'          | N 15°06.0' |
| 20  | 157°40.5'          | S 19°42.3' | 196°18.9'         | S 22°33.3' | 168°18.4'         | S 21°50.8' | 60°56.4'          | N 15°06.6' |
| 21  | 172°39.8'          | S 19°41.9' | 211°21.0'         | S 22°33.3' | 183°20.7'         | S 21°50.7' | 75°57.2'          | N 15°07.2' |
| 22  | 187°39.2'          | S 19°41.5' | 226°23.2'         | S 22°33.4' | 198°22.9'         | S 21°50.7' | 90°58.0'          | N 15°07.7' |
| 23  | 202°38.5'          | S 19°41.0' | 241°25.3'         | S 22°33.4' | 213°25.1'         | S 21°50.7' | 105°58.9'         | N 15°08.3' |

Thu Feb 28, 2019 UTC

| UTC | Venus -4.0         |            | Jupiter -1.9      |            | Saturn +0.6       |            | Mars +1.2         |            |
|-----|--------------------|------------|-------------------|------------|-------------------|------------|-------------------|------------|
|     | v = -0.6' d = 0.4' |            | v = 2.1' d = 0.0' |            | v = 2.2' d = 0.0' |            | v = 0.8' d = 0.6' |            |
|     | GHA                | dec        | GHA               | dec        | GHA               | dec        | GHA               | dec        |
| 0   | 217°37.9'          | S 19°40.6' | 256°27.5'         | S 22°33.4' | 228°27.4'         | S 21°50.7' | 120°59.7'         | N 15°08.9' |
| 1   | 232°37.2'          | S 19°40.2' | 271°29.6'         | S 22°33.4' | 243°29.6'         | S 21°50.6' | 136°00.5'         | N 15°09.4' |
| 2   | 247°36.6'          | S 19°39.8' | 286°31.8'         | S 22°33.4' | 258°31.8'         | S 21°50.6' | 151°01.3'         | N 15°10.0' |
| 3   | 262°35.9'          | S 19°39.3' | 301°33.9'         | S 22°33.5' | 273°34.0'         | S 21°50.6' | 166°02.2'         | N 15°10.5' |
| 4   | 277°35.3'          | S 19°38.9' | 316°36.0'         | S 22°33.5' | 288°36.3'         | S 21°50.5' | 181°03.0'         | N 15°11.1' |
| 5   | 292°34.6'          | S 19°38.5' | 331°38.2'         | S 22°33.5' | 303°38.5'         | S 21°50.5' | 196°03.8'         | N 15°11.7' |
| 6   | 307°34.0'          | S 19°38.0' | 346°40.3'         | S 22°33.5' | 318°40.7'         | S 21°50.5' | 211°04.6'         | N 15°12.2' |
| 7   | 322°33.4'          | S 19°37.6' | 1°42.5'           | S 22°33.5' | 333°43.0'         | S 21°50.5' | 226°05.4'         | N 15°12.8' |
| 8   | 337°32.7'          | S 19°37.2' | 16°44.6'          | S 22°33.5' | 348°45.2'         | S 21°50.4' | 241°06.3'         | N 15°13.3' |
| 9   | 352°32.1'          | S 19°36.7' | 31°46.8'          | S 22°33.6' | 3°47.4'           | S 21°50.4' | 256°07.1'         | N 15°13.9' |
| 10  | 7°31.4'            | S 19°36.3' | 46°48.9'          | S 22°33.6' | 18°49.7'          | S 21°50.4' | 271°07.9'         | N 15°14.5' |
| 11  | 22°30.8'           | S 19°35.9' | 61°51.1'          | S 22°33.6' | 33°51.9'          | S 21°50.4' | 286°08.7'         | N 15°15.0' |
| 12  | 37°30.1'           | S 19°35.4' | 76°53.2'          | S 22°33.6' | 48°54.1'          | S 21°50.3' | 301°09.6'         | N 15°15.6' |
| 13  | 52°29.5'           | S 19°35.0' | 91°55.3'          | S 22°33.6' | 63°56.4'          | S 21°50.3' | 316°10.4'         | N 15°16.2' |
| 14  | 67°28.9'           | S 19°34.6' | 106°57.5'         | S 22°33.6' | 78°58.6'          | S 21°50.3' | 331°11.2'         | N 15°16.7' |
| 15  | 82°28.2'           | S 19°34.1' | 121°59.6'         | S 22°33.7' | 94°00.8'          | S 21°50.2' | 346°12.0'         | N 15°17.3' |
| 16  | 97°27.6'           | S 19°33.7' | 137°01.8'         | S 22°33.7' | 109°03.0'         | S 21°50.2' | 1°12.8'           | N 15°17.8' |
| 17  | 112°26.9'          | S 19°33.2' | 152°03.9'         | S 22°33.7' | 124°05.3'         | S 21°50.2' | 16°13.7'          | N 15°18.4' |
| 18  | 127°26.3'          | S 19°32.8' | 167°06.1'         | S 22°33.7' | 139°07.5'         | S 21°50.2' | 31°14.5'          | N 15°18.9' |
| 19  | 142°25.6'          | S 19°32.3' | 182°08.2'         | S 22°33.7' | 154°09.7'         | S 21°50.1' | 46°15.3'          | N 15°19.5' |
| 20  | 157°25.0'          | S 19°31.9' | 197°10.4'         | S 22°33.8' | 169°12.0'         | S 21°50.1' | 61°16.1'          | N 15°20.1' |
| 21  | 172°24.4'          | S 19°31.5' | 212°12.5'         | S 22°33.8' | 184°14.2'         | S 21°50.1' | 76°16.9'          | N 15°20.6' |
| 22  | 187°23.7'          | S 19°31.0' | 227°14.7'         | S 22°33.8' | 199°16.4'         | S 21°50.1' | 91°17.8'          | N 15°21.2' |
| 23  | 202°23.1'          | S 19°30.6' | 242°16.8'         | S 22°33.8' | 214°18.7'         | S 21°50.0' | 106°18.6'         | N 15°21.7' |