

TABLE 1
MERIDIAN PASSAGE AND DECLINATION
OF THE SUN AT 12^h UT

TABLES 2 and 3
DEPRESSION OF SUN
AT VARIOUS HEIGHTS

| Day | January | | February | | March | | April | | May | | June | | Height | TABLE 2 AT SUNRISE AND SUNSET | | TABLE 3 AT CIVIL TWILIGHT | |
|-----|-----------------|-----|-----------------|-----|-----------------|-----|-----------------|-----|-----------------|-----|-----------------|-----|--------|-------------------------------------|------------|---------------------------------|------------|
| | Mer. Pass. | Dec | Mer. Pass. | Dec | Mer. Pass. | Dec | Mer. Pass. | Dec | Mer. Pass. | Dec | Mer. Pass. | Dec | | Feet | Depression | Diff. from 0°8 | Depression |
| | 12 ^h | | 12 ^h | | 12 ^h | | 12 ^h | | 12 ^h | | 12 ^h | | | | | | |
| | m ° | | m ° | | m ° | | m ° | | m ° | | m ° | | | | | | |
| 1 | +04 S 23.0 | | +14 S 17.0 | | +12 S 7.5 | | +04 N 4.7 | | -03 N 15.2 | | -02 N 22.1 | | | | | | |
| 2 | +04 22.9 | | +14 16.7 | | +12 7.1 | | +04 5.0 | | -03 15.5 | | -02 22.2 | | | | | | |
| 3 | +04 22.8 | | +14 16.4 | | +12 6.7 | | +03 5.4 | | -03 15.8 | | -02 22.3 | | | | | | |
| 4 | +05 22.7 | | +14 16.1 | | +12 6.3 | | +03 5.8 | | -03 16.1 | | -02 22.5 | | | | | | |
| 5 | +05 22.6 | | +14 15.8 | | +11 5.9 | | +03 6.2 | | -03 16.3 | | -01 22.6 | | | | | | |
| 6 | +06 S 22.5 | | +14 S 15.5 | | +11 S 5.6 | | +02 N 6.6 | | -03 N 16.6 | | -01 N 22.7 | | | | | | |
| 7 | +06 22.3 | | +14 15.2 | | +11 5.2 | | +02 6.9 | | -03 16.9 | | -01 22.8 | | | | | | |
| 8 | +07 22.2 | | +14 14.9 | | +11 4.8 | | +02 7.3 | | -04 17.2 | | -01 22.9 | | | | | | |
| 9 | +07 22.1 | | +14 14.6 | | +10 4.4 | | +02 7.7 | | -04 17.4 | | -01 23.0 | | | | | | |
| 10 | +08 21.9 | | +14 14.3 | | +10 4.0 | | +01 8.1 | | -04 17.7 | | -01 23.0 | | | | | | |
| 11 | +08 S 21.8 | | +14 S 13.9 | | +10 S 3.6 | | +01 N 8.4 | | -04 N 18.0 | | 00 N 23.1 | | 1 000 | 1.5 | 0.7 | 6.0 | 5.2 |
| 12 | +08 21.6 | | +14 13.6 | | +10 3.2 | | +01 8.8 | | -04 18.2 | | 00 23.2 | | 2 000 | 1.7 | 0.9 | 6.1 | 5.3 |
| 13 | +09 21.4 | | +14 13.3 | | +09 2.8 | | 00 9.2 | | -04 18.5 | | 00 23.2 | | 3 000 | 1.9 | 1.1 | 6.1 | 5.3 |
| 14 | +09 21.3 | | +14 12.9 | | +09 2.4 | | 00 9.5 | | -04 18.7 | | 00 23.3 | | 4 000 | 2.1 | 1.3 | 6.1 | 5.3 |
| 15 | +09 21.1 | | +14 12.6 | | +09 2.0 | | 00 9.9 | | -04 18.9 | | +01 23.3 | | 5 000 | 2.2 | 1.4 | 6.2 | 5.4 |
| 16 | +10 S 20.9 | | +14 S 12.2 | | +09 S 1.6 | | 00 N 10.2 | | -04 N 19.2 | | +01 N 23.4 | | 6 000 | 2.4 | 1.6 | 6.2 | 5.4 |
| 17 | +10 20.7 | | +14 11.9 | | +08 1.2 | | 00 10.6 | | -04 19.4 | | +01 23.4 | | 7 000 | 2.5 | 1.7 | 6.2 | 5.4 |
| 18 | +10 20.5 | | +14 11.5 | | +08 0.8 | | -01 10.9 | | -04 19.6 | | +01 23.4 | | 8 000 | 2.6 | 1.8 | 6.3 | 5.5 |
| 19 | +11 20.3 | | +14 11.2 | | +08 S 0.4 | | -01 11.3 | | -04 19.8 | | +01 23.4 | | 9 000 | 2.7 | 1.9 | 6.3 | 5.5 |
| 20 | +11 20.1 | | +14 10.8 | | +07 N 0.0 | | -01 11.6 | | -03 20.0 | | +02 23.4 | | 10 000 | 2.8 | 2.0 | 6.3 | 5.5 |
| 21 | +11 S 19.8 | | +14 S 10.5 | | +07 N 0.4 | | -01 N 12.0 | | -03 N 20.2 | | +02 N 23.4 | | | | | | |
| 22 | +12 19.6 | | +13 10.1 | | +07 0.7 | | -02 12.3 | | -03 20.4 | | +02 23.4 | | 15 000 | 3.2 | 2.4 | 6.5 | 5.7 |
| 23 | +12 19.4 | | +13 9.7 | | +07 1.1 | | -02 12.6 | | -03 20.6 | | +02 23.4 | | 20 000 | 3.6 | 2.8 | 6.6 | 5.8 |
| 24 | +12 19.1 | | +13 9.4 | | +06 1.5 | | -02 13.0 | | -03 20.8 | | +02 23.4 | | 25 000 | 3.9 | 3.1 | 6.8 | 6.0 |
| 25 | +12 18.9 | | +13 9.0 | | +06 1.9 | | -02 13.3 | | -03 21.0 | | +03 23.4 | | 30 000 | 4.2 | 3.4 | 6.9 | 6.1 |
| | | | | | | | | | | | | | 35 000 | 4.4 | 3.6 | 7.1 | 6.3 |
| 26 | +13 S 18.6 | | +13 S 8.6 | | +06 N 2.3 | | -02 N 13.6 | | -03 N 21.2 | | +03 N 23.3 | | | | | | |
| 27 | +13 18.4 | | +13 8.2 | | +05 2.7 | | -02 13.9 | | -03 21.3 | | +03 23.3 | | 40 000 | 4.7 | 3.9 | 7.2 | 6.4 |
| 28 | +13 18.1 | | +12 S 7.9 | | +05 3.1 | | -03 14.2 | | -03 21.5 | | +03 23.3 | | 45 000 | 4.9 | 4.1 | 7.3 | 6.5 |
| 29 | +13 17.9 | | | | +05 3.5 | | -03 14.6 | | -03 21.7 | | +04 23.2 | | 50 000 | 5.1 | 4.3 | 7.5 | 6.7 |
| 30 | +13 17.6 | | | | +04 3.9 | | -03 N 14.9 | | -02 21.8 | | +04 N 23.2 | | 55 000 | 5.3 | 4.5 | 7.6 | 6.8 |
| 31 | +13 S 17.3 | | | | +04 N 4.3 | | | | -02 N 22.0 | | | | 60 000 | 5.5 | 4.7 | 7.7 | 6.9 |

An alternative method to those given on pages A12–A14 is to use the graphs to give the corrections to the tabulated times of sunrise and sunset at ground level; in this case it is adequate to use the graphs for the *nearest* tabular latitude and declination. The difference in hour angle is found between the hour angle for zero depression and the hour angle at the tabular depression minus 0°8. The difference in hour angle so found is then applied to the time of sunrise or sunset. The result will be less than 5^m in error if the declination curve cuts all the depression lines.

Example. To find the times of sunrise and sunset on 2026 April 19 in latitude N 65° 17', longitude W 35° 15', at a height of 37 000 feet. From Table 1, Dec = N 11°3; Table 2, Depression diff. from 0°8 = 3°7.

| | | |
|--|---------|--------|
| | Sunrise | Sunset |
| | h m | h m |
| Page 14, N 65° 17' | 04 08 | 19 52 |
| Page 63, Lat 66°, Dec 11° (same); diff. in HA from depression 0° to 3°7 | -45 | +45 |
| LMT | 03 23 | 20 37 |
| Longitude W 35° 15' | 2 21 | 2 21 |
| UT | 05 44 | 22 58 |

TABLE 1
MERIDIAN PASSAGE AND DECLINATION
OF THE SUN AT 12^h UT

TABLES 2 and 3
DEPRESSION OF SUN
AT VARIOUS HEIGHTS

| D a y | July | | August | | September | | October | | November | | December | | Height | TABLE 2 AT SUNRISE AND SUNSET | | TABLE 3 AT CIVIL TWILIGHT | |
|-------------|------------------------|------|------------------------|------|------------------------|-----|------------------------|------|------------------------|------|------------------------|------|--------|-------------------------------------|------------|---------------------------------|------------|
| | Mer. Pass. | Dec | Mer. Pass. | Dec | Mer. Pass. | Dec | Mer. Pass. | Dec | Mer. Pass. | Dec | Mer. Pass. | Dec | | Feet | Depression | Diff. from 0°8 | Depression |
| | 12 ^h m ° | | 12 ^h m ° | | 12 ^h m ° | | 12 ^h m ° | | 12 ^h m ° | | 12 ^h m ° | | | ° | ° | ° | ° |
| 1 | +04 N | 23.1 | +06 N | 17.9 | 00 N | 8.2 | -10 S | 3.3 | -16 S | 14.5 | -11 S | 21.8 | | | | | |
| 2 | +04 | 23.0 | +06 | 17.7 | 00 | 7.8 | -11 | 3.7 | -16 | 14.8 | -11 | 22.0 | | | | | |
| 3 | +04 | 22.9 | +06 | 17.4 | -01 | 7.4 | -11 | 4.1 | -16 | 15.2 | -10 | 22.1 | | | | | |
| 4 | +04 | 22.8 | +06 | 17.2 | -01 | 7.1 | -11 | 4.5 | -16 | 15.5 | -10 | 22.3 | | | | | |
| 5 | +05 | 22.8 | +06 | 16.9 | -01 | 6.7 | -12 | 4.8 | -16 | 15.8 | -09 | 22.4 | | | | | |
| 6 | +05 N | 22.7 | +06 N | 16.6 | -02 N | 6.3 | -12 S | 5.2 | -16 S | 16.1 | -09 S | 22.5 | | | | | |
| 7 | +05 | 22.6 | +06 | 16.3 | -02 | 6.0 | -12 | 5.6 | -16 | 16.4 | -09 | 22.6 | | | | | |
| 8 | +05 | 22.4 | +06 | 16.0 | -02 | 5.6 | -12 | 6.0 | -16 | 16.7 | -08 | 22.7 | | | | | |
| 9 | +05 | 22.3 | +06 | 15.8 | -03 | 5.2 | -13 | 6.4 | -16 | 16.9 | -08 | 22.8 | | | | | |
| 10 | +05 | 22.2 | +05 | 15.5 | -03 | 4.8 | -13 | 6.8 | -16 | 17.2 | -07 | 22.9 | | | | | |
| 11 | +06 N | 22.1 | +05 N | 15.2 | -03 N | 4.4 | -13 S | 7.1 | -16 S | 17.5 | -07 S | 23.0 | 1000 | 1.5 | 0.7 | 6.0 | 5.2 |
| 12 | +06 | 21.9 | +05 | 14.9 | -04 | 4.1 | -14 | 7.5 | -16 | 17.8 | -06 | 23.1 | 2000 | 1.7 | 0.9 | 6.1 | 5.3 |
| 13 | +06 | 21.8 | +05 | 14.6 | -04 | 3.7 | -14 | 7.9 | -16 | 18.0 | -06 | 23.2 | 3000 | 1.9 | 1.1 | 6.1 | 5.3 |
| 14 | +06 | 21.6 | +05 | 14.3 | -04 | 3.3 | -14 | 8.3 | -16 | 18.3 | -05 | 23.2 | 4000 | 2.1 | 1.3 | 6.1 | 5.3 |
| 15 | +06 | 21.5 | +05 | 14.0 | -05 | 2.9 | -14 | 8.6 | -15 | 18.6 | -05 | 23.3 | 5000 | 2.2 | 1.4 | 6.2 | 5.4 |
| 16 | +06 N | 21.3 | +04 N | 13.6 | -05 N | 2.5 | -14 S | 9.0 | -15 S | 18.8 | -04 S | 23.3 | 6000 | 2.4 | 1.6 | 6.2 | 5.4 |
| 17 | +06 | 21.1 | +04 | 13.3 | -05 | 2.1 | -15 | 9.4 | -15 | 19.1 | -04 | 23.4 | 7000 | 2.5 | 1.7 | 6.2 | 5.4 |
| 18 | +06 | 21.0 | +04 | 13.0 | -06 | 1.7 | -15 | 9.7 | -15 | 19.3 | -03 | 23.4 | 8000 | 2.6 | 1.8 | 6.3 | 5.5 |
| 19 | +06 | 20.8 | +04 | 12.7 | -06 | 1.4 | -15 | 10.1 | -15 | 19.5 | -03 | 23.4 | 9000 | 2.7 | 1.9 | 6.3 | 5.5 |
| 20 | +06 | 20.6 | +03 | 12.3 | -07 | 1.0 | -15 | 10.4 | -14 | 19.8 | -02 | 23.4 | 10000 | 2.8 | 2.0 | 6.3 | 5.5 |
| 21 | +06 N | 20.4 | +03 N | 12.0 | -07 N | 0.6 | -15 S | 10.8 | -14 S | 20.0 | -02 S | 23.4 | | | | | |
| 22 | +07 | 20.2 | +03 | 11.7 | -07 N | 0.2 | -16 | 11.2 | -14 | 20.2 | -01 | 23.4 | 15000 | 3.2 | 2.4 | 6.5 | 5.7 |
| 23 | +07 | 20.0 | +03 | 11.3 | -08 S | 0.2 | -16 | 11.5 | -14 | 20.4 | -01 | 23.4 | 20000 | 3.6 | 2.8 | 6.6 | 5.8 |
| 24 | +07 | 19.8 | +02 | 11.0 | -08 | 0.6 | -16 | 11.9 | -13 | 20.6 | 00 | 23.4 | 25000 | 3.9 | 3.1 | 6.8 | 6.0 |
| 25 | +07 | 19.6 | +02 | 10.6 | -08 | 1.0 | -16 | 12.2 | -13 | 20.8 | 00 | 23.4 | 30000 | 4.2 | 3.4 | 6.9 | 6.1 |
| | | | | | | | | | | | | | 35000 | 4.4 | 3.6 | 7.1 | 6.3 |
| 26 | +07 N | 19.4 | +02 N | 10.3 | -09 S | 1.4 | -16 S | 12.5 | -13 S | 21.0 | +01 S | 23.4 | | | | | |
| 27 | +07 | 19.1 | +02 | 10.0 | -09 | 1.8 | -16 | 12.9 | -12 | 21.2 | +01 | 23.3 | 40000 | 4.7 | 3.9 | 7.2 | 6.4 |
| 28 | +07 | 18.9 | +01 | 9.6 | -09 | 2.1 | -16 | 13.2 | -12 | 21.4 | +02 | 23.3 | 45000 | 4.9 | 4.1 | 7.3 | 6.5 |
| 29 | +07 | 18.7 | +01 | 9.2 | -10 | 2.5 | -16 | 13.5 | -12 | 21.5 | +02 | 23.2 | 50000 | 5.1 | 4.3 | 7.5 | 6.7 |
| 30 | +06 | 18.4 | +01 | 8.9 | -10 S | 2.9 | -16 | 13.9 | -11 S | 21.7 | +02 | 23.1 | 55000 | 5.3 | 4.5 | 7.6 | 6.8 |
| 31 | +06 N | 18.2 | 00 N | 8.5 | | | -16 S | 14.2 | | | +03 S | 23.1 | 60000 | 5.5 | 4.7 | 7.7 | 6.9 |

An example of the use of the above tables is given on page A151.