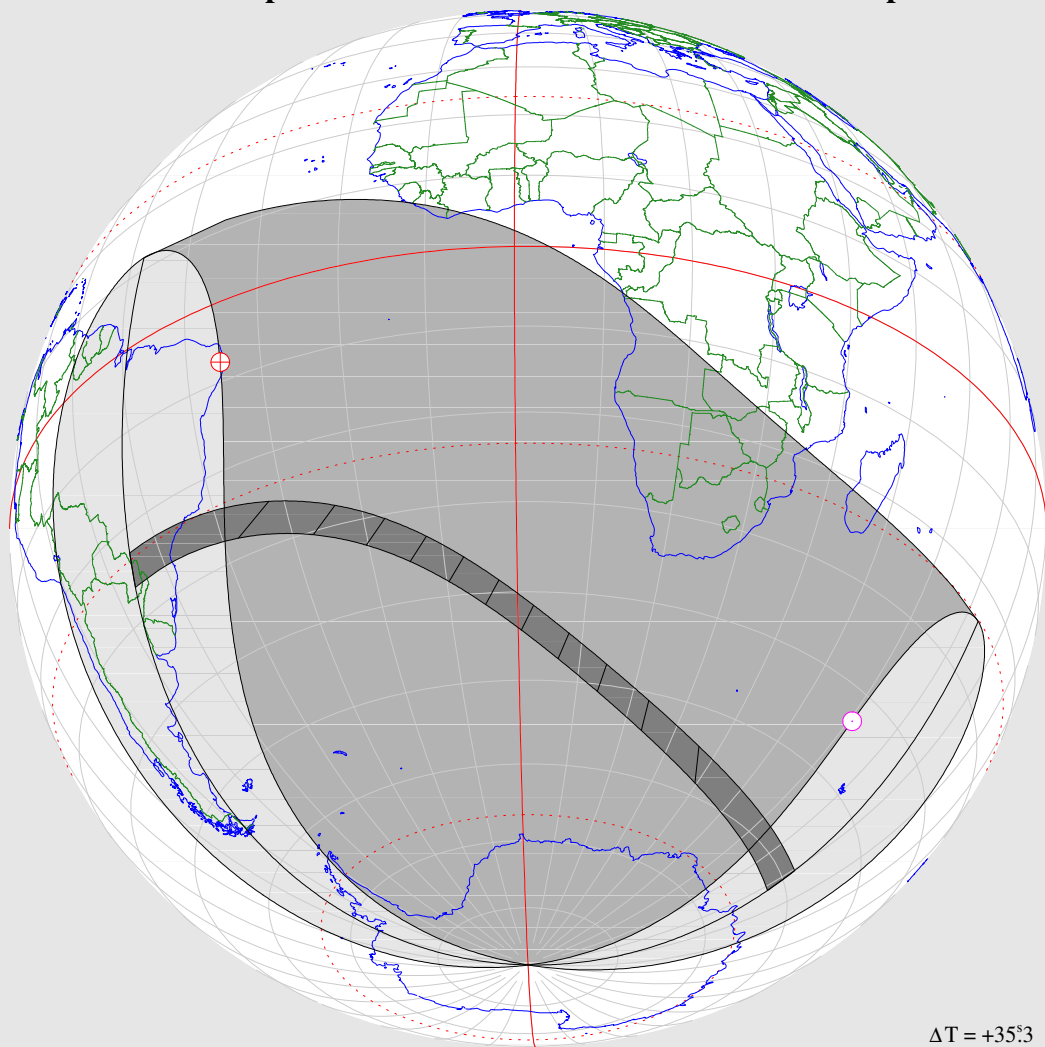


### III. - Annular Eclipse of the Sun

1661 September 23



©HM Nautical Almanac Office

$\Delta T = +35^s.3$   
Globe centred on E 1°5' and S 33°0'

| Circumstances                                    | Time (UT) |      | Longitude |      | Latitude |      |
|--|-----------|------|-----------|------|----------|------|
|  | h         | m    | °         | '    | °        | '    |
| ⊕ Eclipse begins; first contact with Earth       | 8         | 13.1 | W 35      | 17.1 | S 7      | 36.7 |
| Beginning of northern limit of penumbra          | 9         | 03.3 | W 47      | 44.3 | N 12     | 01.1 |
| Beginning of northern limit of umbra             | 9         | 31.4 | W 54      | 56.6 | S 22     | 46.7 |
| Beginning of centre line; central eclipse begins | 9         | 33.9 | W 55      | 34.6 | S 24     | 35.3 |
| Beginning of southern limit of umbra             | 9         | 36.5 | W 56      | 14.9 | S 26     | 27.1 |
| Central eclipse at local apparent noon           | 11        | 27.5 | E 6       | 08.3 | S 45     | 24.7 |
| End of southern limit of umbra                   | 12        | 27.1 | E 81      | 52.0 | S 62     | 02.8 |
| End of centre line; central eclipse ends         | 12        | 29.7 | E 81      | 09.4 | S 60     | 11.4 |
| End of northern limit of umbra                   | 12        | 32.2 | E 80      | 29.6 | S 58     | 23.3 |
| End of northern limit of penumbra                | 13        | 00.6 | E 73      | 00.2 | S 23     | 41.0 |
| ⊙ Eclipse ends; last contact with Earth          | 13        | 50.6 | E 60      | 41.1 | S 43     | 15.5 |