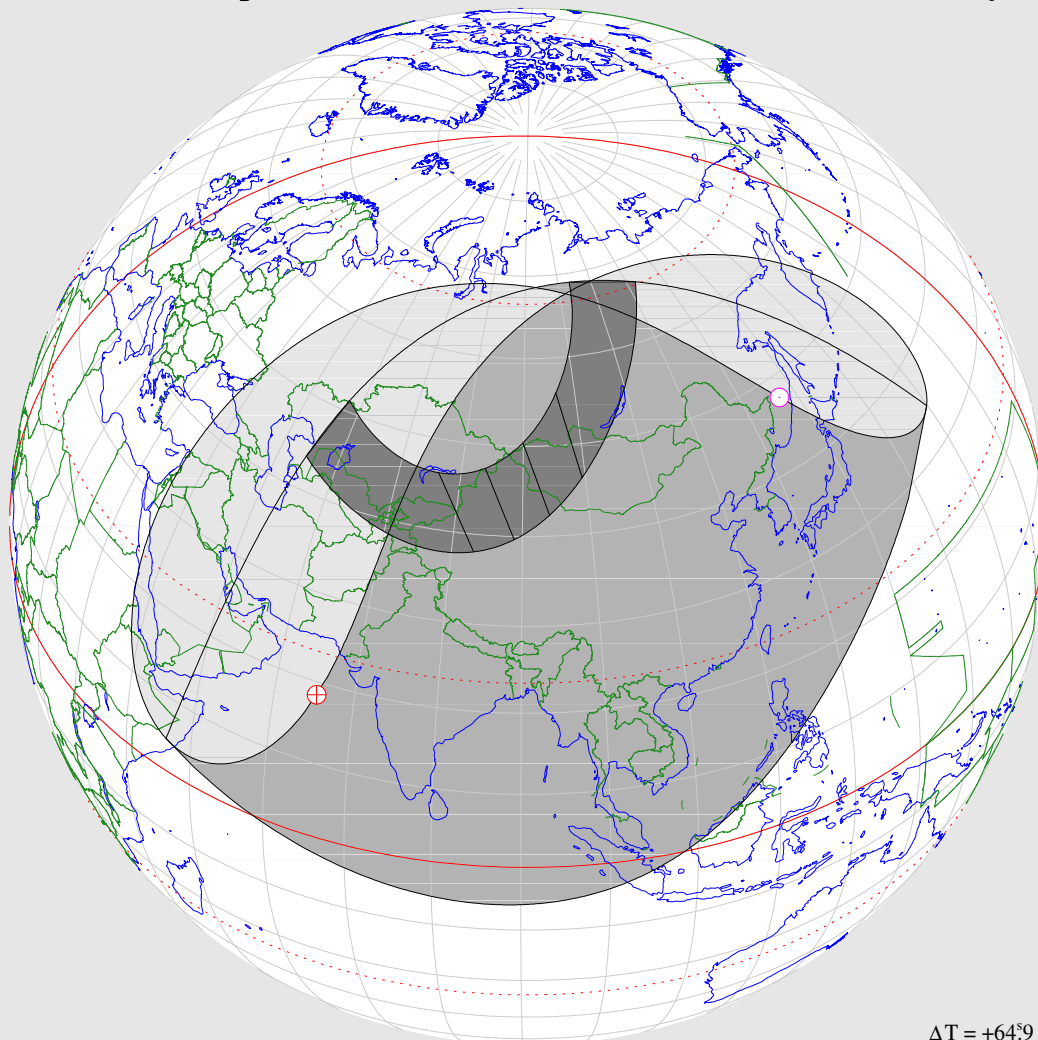


I. - Annular Eclipse of the Sun

1638 January 15



©HM Nautical Almanac Office

$\Delta T = +64^s.9$
Globe centred on E $90^{\circ}8'$ and N $41^{\circ}1'$

Circumstances	Time (UT)		Longitude	Latitude
	h	m	$^{\circ}$ / $'$	$^{\circ}$ / $'$
⊕ Eclipse begins; first contact with Earth	2	18.6	E 65 20.5	N 18 27.4
Beginning of southern limit of penumbra	3	11.9	E 46 20.0	N 4 30.3
Beginning of southern limit of umbra	3	58.4	E 54 35.3	N 43 37.0
Beginning of centre line; central eclipse begins	4	05.8	E 55 42.5	N 47 05.2
Beginning of northern limit of umbra	4	15.2	E 57 30.8	N 51 11.8
Central eclipse at local apparent noon	5	22.9	E 101 51.6	N 53 45.3
End of northern limit of umbra	5	26.0	E 103 30.5	N 68 51.3
End of centre line; central eclipse ends	5	35.5	E 114 26.7	N 68 07.7
End of southern limit of umbra	5	42.8	E 122 33.1	N 66 47.7
End of southern limit of penumbra	6	29.5	E 159 47.6	N 34 32.1
⊙ Eclipse ends; last contact with Earth	7	22.8	E 136 50.7	N 47 38.0