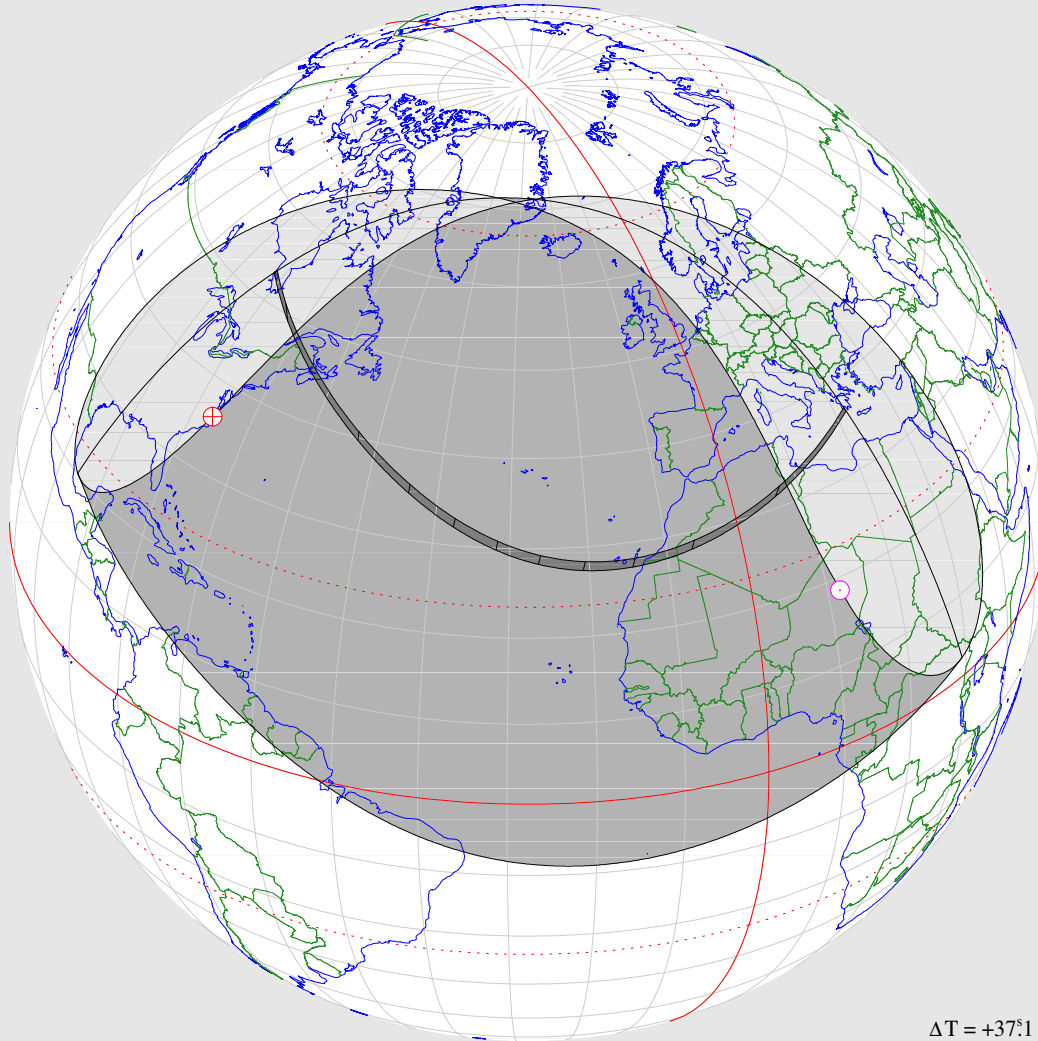


IV. - Total Eclipse of the Sun

1659 November 14



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$\Delta T = +37^s.1$
Globe centred on W 27°7' and N 32°9'

Circumstances	Time (UT)		Longitude		Latitude	
	h	m	°	'	°	'
⊕ Eclipse begins; first contact with Earth	11	46.7	W 76	29.0	N 36	01.7
Beginning of southern limit of penumbra	12	34.3	W 95	22.3	N 20	08.0
Beginning of southern limit of umbra	12	58.9	W 82	17.0	N 53	05.1
Beginning of centre line; central eclipse begins	12	59.1	W 82	09.7	N 53	16.2
Beginning of northern limit of umbra	12	59.4	W 82	02.2	N 53	27.3
Central eclipse at local apparent noon	13	56.6	W 32	55.4	N 30	43.2
End of northern limit of umbra	15	19.7	E 21	53.9	N 36	50.7
End of centre line; central eclipse ends	15	20.0	E 21	56.5	N 36	37.6
End of southern limit of umbra	15	20.3	E 21	59.0	N 36	24.6
End of southern limit of penumbra	15	44.6	E 29	15.9	N 2	26.2
○ Eclipse ends; last contact with Earth	16	32.3	E 11	44.0	N 18	34.6