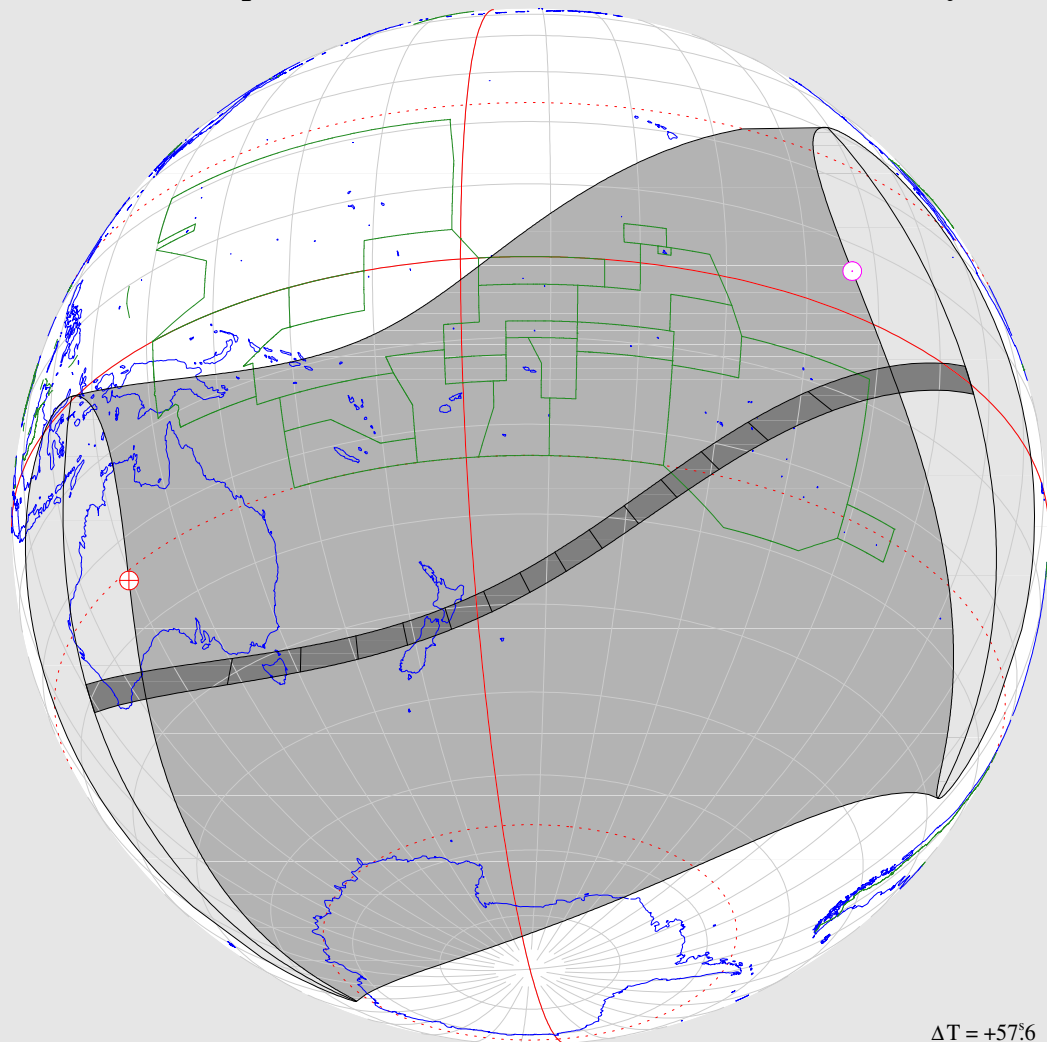


# I. - Annular Eclipse of the Sun

1991 January 15-16



©HM Nautical Almanac Office

$\Delta T = +57^s.6$   
Globe centred on W 172°3' and S 31°4'

Circumstances	Time (UT)	Longitude	Latitude
	<sup>h</sup> <sup>m</sup>	<sup>o</sup> /	<sup>o</sup> /
⊕ Eclipse begins; first contact with Earth	20 51.0	E 129 29.8	S 24 28.9
Beginning of northern limit of penumbra	21 47.8	E 125 36.1	N 0 30.5
Beginning of northern limit of umbra	21 58.6	E 110 37.4	S 28 30.7
Beginning of centre line; central eclipse begins	21 59.9	E 109 35.7	S 29 51.9
Beginning of southern limit of umbra	22 01.3	E 108 31.6	S 31 13.6
Beginning of southern limit of penumbra	22 55.8	E 56 56.3	S 63 46.1
Central eclipse at local apparent noon	23 43.5	W 173 30.6	S 37 47.7
End of southern limit of penumbra	0 50.3	W 82 37.8	S 38 05.0
End of southern limit of umbra	1 44.6	W 113 25.3	S 0 55.7
End of centre line; central eclipse ends	1 45.9	W 114 17.4	N 0 27.4
End of northern limit of umbra	1 47.2	W 115 08.4	N 1 49.8
End of northern limit of penumbra	1 57.7	W 130 19.7	N 30 48.0
⊙ Eclipse ends; last contact with Earth	2 54.8	W 133 36.8	N 5 57.0