

Celestial Navigation When Your GPS Fails

by Mark Breach

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Celestial Navigation When Your GPS Fails is about finding position at sea from the Sun, Moon, planets or stars. If you have a sextant and the time, in both senses, this book contains all you need to find your position.

This book is for real and aspiring bluewater sailors; those who leave the sight of land and rely on various electronic devices for navigation. When satellite navigation fails because of seawater in the electronics or just plain battery failure then being lost at sea is a life-threatening situation, especially when night falls.

Everything you need is here, apart from the sextant and a watch. A calculator is handy but not essential. There is complete instruction on how to use a sextant, on making astronomical observations and on how to do the calculations with or without the forms. All tables and the forms needed to make the calculations are available. You do not need any further almanacs or tables for the next ten years!

The text explains the celestial framework in which we must operate, with particular reference to the way that the Sun, Moon stars and planets appear and the principles of astronomical navigation. The sextant is described along with its errors and the necessary

corrections that need to be applied. Reductions of observations for dip, refraction, semi-diameter of bodies and parallax are covered. With the theory well established, the practicalities of position finding are explained in detail.

There is a chapter on the origins of some of the formulae used for those who want a deeper understanding of the mathematics involved but this may be omitted by those who prefer to focus more on the practice of position finding. The main text concludes with a detailed worked example and blank forms for your own observations of celestial bodies and for the calculation of position.

About the Author

Dr Mark Breach, MA MSc PhD FRICS FInstCES FRAS AFRIN, is a Principal Lecturer at Nottingham Trent University, England. He lectures in Mathematics, Geodesy and Navigation. He holds Master's degrees from Cambridge and Oxford; his PhD was concerned with astronomical positioning. He is an Associate Fellow of the Royal Institution of Navigation and a Fellow of the Royal Astronomical Society, the Royal Institution of Chartered Surveyors and the Institution of Civil Engineering Surveyors.

Born and brought up in Falmouth, England, he has been around boats since a boy. From an Atlantic crossing under sail in his teens (long before the luxury of GPS) he has crewed, skippered and navigated thousands of nautical miles with his yacht, *SunArise*, kept on the River Humber; the East Coast of England and Scotland is his current cruising grounds.