The Electronic Chart
2nd Edition

The 2nd Edition of The Electronic Chart has been available since May 2006 and has been extensively revised, updated and expanded by some 40 pages since originally published in December 2002. This is a book which, in my opinion, lays to rest several of the myths associated with electronic charts, in general, and Electronic Chart Display and Information Systems (ECDIS) in particular and should be regarded as essential reading.

The five co-authors of the book are all well-known and highly respected in hydrographic and electronic charting circles and have all been actively involved in many aspects of ECDIS development from the earliest days. Their combined knowledge and technical ability constitutes one of the most knowledgeable group of electronic charting experts to be found anywhere in the world today.

The book itself largely follows the format of the 2002 edition but with some noticeable changes. It starts off by describing an imaginary voyage, undertaken aboard a vessel equipped with an electronic charting system, to give the reader a feel for both the potential and complexity of this new type of shipboard navigation system. The essential elements of the system are fully described including the automatic and continuous display of the ship's position against the electronic chart backdrop, the immediate availability of information applicable to a given situation, the decision-support nature of the system and its overall contribution to safe and efficient navigation. Subsequent chapters expand on the concepts and issues identified during the imaginary voyage, including easily readable sections on the navigation functions of the electronic chart and its integration with other navigational systems.
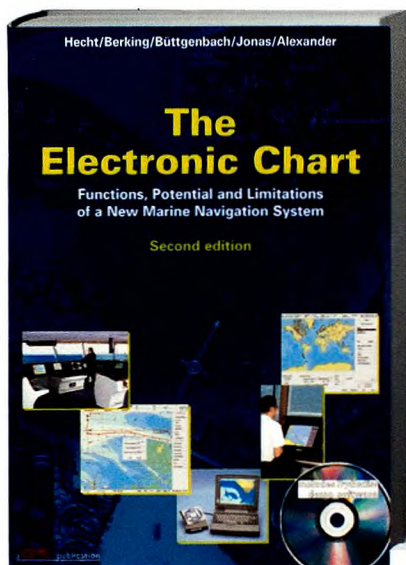
Whilst the components and functions of a shipboard electronic chart display and the differences between an ECDIS, an ECDIS operating in the Raster Chart

Display System (RCDS) mode and an ECS (Electronic Chart System) are fully explained early on in the book, the authors recognise that some readers may be interested in gaining a greater understanding of certain underlying concepts. Chapter 4, for example, is devoted to providing a detailed technical description of the electronic chart data which is used in all electronic chart systems and describes the different data types as well as how the data is organised and produced. A thorough description is also included of the IHO's S-57 transfer standard for digital hydrographic data and the associated product specification for ENCs.

As one reads further into the book, it becomes apparent that an electronic chart system is more than just a means of displaying digital nautical charts. ECDIS, in particular, is a highly sophisticated system which, in addition to a range of navigational functions, also includes components of a complex, computer-based information system. Whilst ECDIS is primed to change the manner in which navigation is conducted in the future, the manner in which mariners are trained to use the systems must also change in a likewise manner. The book therefore devotes several pages to the importance of ECDIS training and highlights the need for care to be taken when navigating with such a system to avoid incorrect operation, misinterpretation, malfunction or an over-reliance on what is a highly-automated navigation system.

A new chapter entitled "Trends of Current Development in Electronic Charting" touches upon issues that are considered to be barriers to the implementation of ECDIS, to satisfy the carriage requirements for nautical charts set out in Chapter V of the Safety of Life at Sea (SOLAS) Convention. Such issues include the level of worldwide ENC coverage and problems associated with the lack of clarity regarding ECDIS regulations by individual flag States. As well, problems are examined in service delivery to achieve chart data which not only has comprehensive coverage but also has uniform display characteristics, common data quality, single license availability and with various options for customised packages at attractive prices.

A CD-ROM version of a sophisticated ECDIS demonstration program entitled TryEcdis! accompanies the book and offers, with certain restrictions, all basic functions of a real ECDIS. The program, supported by a comprehensive 112 page instruction manual, enables the user to practice not only such navigation tasks as route planning, checking and monitoring, but also setting a safety contour to display safe and unsafe waters graphically, toggling between day and night displays and between traditional and simplified ECDIS chart symbols, querying chart objects to get detailed background information, using various tools to carry out chartwork activities normally associated with paper charts and a host of other navigational functions. Sample Electronic Navigational Charts (ENCs) of four locations in Germany, USA and Singapore, along with two United Kingdom Raster Navigational Charts (RNCs), are included in the package. These can be used in a simulator mode to enable routes to be sailed within the chart coverage areas and for a realistic assessment of the main ECDIS functionality, including "dual-fuel" operation, to be undertaken.

In summary, this book and the accompanying demonstration software is highly recommended for anyone with an interest in shipboard navigation. The IMO has already mandated ECDIS for High Speed Craft, with effect from 2008 for new craft, and further work will commence shortly to explore the case for mandatory carriage of ECDIS on other ship types as a cost-effective risk control option to ensure safety of navigation. I would therefore commend, in particular, the combined book and software package to any ship operators who are contemplating the future use of electronic charts aboard their vessels, as all of the issues from system hardware and software, chart data types and structures, training requirements, safety, legal and economic considerations are fully covered.

Reviewed by: Capt Joe Collins FRIN, MNI; Head of Navigation Safety Brach; UK Maritime and Coastguard Agency