



Endeavour[®] 5 Navigator

Electronic Charts

AT A GLANCE



Other terms

ECDIS: Electronic Chart Display Information System is a complete Hardware and Software system which conforms to the IMO S-57 requirements. To be called an ECDIS, the system must undergo testing and assessment by authorised IMO representatives

Official data: data which has been released by the National authorities developed from the original hydrographic surveys

NGA DNC: USA Defence format similar to S-57 used for vector military charts

AML: Additional Military Layers – encoded military data for ENC

The term “Electronic Chart” can be quite confusing because it is a generic term used to describe a form of the digital representation usually of a “paper navigation chart”. An electronic chart can be provided in various digital vector and raster formats as well depict chart detail in a comprehensive manner (similar to a paper chart) or in a simple lines and polygon fill display (coastline, land fill, depth contours and names).

In terms of HSA's Endeavour[®] product range, the following types of electronic chart are utilised:

S-57 ENC: This is the official Electronic Navigation Chart (ENC) vector format supported by the international hydrographic charting authorities. The format is in accordance to the S-57 ENC Specification. Raster images and text files are also supported for pictorial and text descriptions of certain charted features. The content of the ENC is comparable to the published paper chart. Some hydrographic charting authorities are also providing ENC data sourced from hydrographic surveys, thus providing more detailed hydrographic detail than is shown on the paper chart. ENCs have a formal updating mechanism. This data can be used in ECDIS and ECS systems. S-57 ENC data will usually be distributed by the national hydrographic authority.

SENC: This is the proprietary internal system format used by the ECDIS and ECS manufacturers for operational use. The S-57 ENC data format is not optimised for real-time use. Hence, the ENC data needs to be translated into a SENC format to enable real-time use of the data. There is no loss of data during the translation of the ENC to the SENC. The SENC will be distributed by the ECDIS or ECS manufacturer. Updates to the SENC are sourced from S-57 ENC Updates and will be implemented either through the system's update capabilities and/or provision of updated SENC files by the manufacturer.

RNC: The Raster Navigation Chart (RNC) is a digital raster representation of the published paper chart. Since the mid-1990's, two official RNC formats are used within the hydrographic charting community: The Hydrographic Chart Raster Format (HCRF) was developed by the UKHO and is the format used for the UK (ARCS), Australia (Seafarer) and New Zealand (NZMariner) RNC products. The BSB format was developed within the USA and is the format used for the NOAA (USA) and Canadian RNC products.



Endeavour Products

Endeavour® 5 ECDIS:

- IMO Certified Hardware and Software system
- Uses official RNC & ENC
- Conforms to international ECDIS specifications

Endeavour® 5 Navigator:

- HSA PC based product
- Uses official RNC & ENC
- Conforms to S-57 specifications



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Official RNC products are maintained by regular Updates from the various hydrographic chart authorities. RNCs provide a faithful representation of the paper chart and when used in an ECDIS, are considered by some hydrographic authorities to be "paper chart equivalent". The drawback with the RNC product is that it doesn't provide the detailed data like an S-57 ENC that is used by the ECDIS to warn the user of shoal areas, dangers, bridge heights, etc.

NGA DNC: The American Defence Agency NGA, produces a digital vector navigation chart product called the Digital Navigation Chart (DNC). It is a product that is similar to the S-57 ENC in terms of data content and presentation.

Other Electronic Charts and Enhancements

Several system manufacturers have developed their own electronic chart products. These proprietary products serve a number of user markets and so the content and display of the data ranges from generalised outlines of coastline and other chart features through to detailed representation of the published paper chart. These electronic charts are used in ECS equipment and should only be used in conjunction with the paper chart.

Electronic chart products are also being enhanced to meet specific user requirements. In Europe and the USA, various waterways authorities are developing specifications and data for Inland ECDIS. Also, various military agencies are developing a specification to encode specific military data (Additional Military Layers – AML). Both data products are being developed to be used in conjunction with S-57 ENC data. Other electronic chart data include real-time tides, ice, oceanographic data and sailing directions publications.

What electronic charts are supported within HSA's Endeavour® range?

HSA's Endeavour® systems use the following data:

- S-57 ENC
- UKHO ARCS
- Australian Seafarer
- NZMariner RNC

Availability of Electronic Charts

One of the main problems with the introduction of ECDIS has been the small amount of available "official" S-57 ENC data. This problem has allowed private ECS manufacturers to develop their own electronic chart products and several data products provide world-wide coverage, often with the data content poor in terms of depiction and accuracy. Most national hydrographic authorities are now releasing official ENC product with the gap in ENC coverage being filled by the RNC data coverage.