

Hydrographic Organisation's (IHO's) S57 Version 3 Product Standard, and can only be issued by, or on the authority of, a government-authorised Hydrographic Office (HO). Each IHO member nation is responsible for producing ENC's of its own waters, and systematically updating them with all safety-critical information.

ENC Production Status

Worldwide ENC availability has accelerated considerably in the last few years, and some areas (e.g. Northern Europe) are now populated with near seamless coverage. However, some nations do not yet have the capability and/or capacity to produce ENC's of their national waters, and so some areas will remain unpopulated for the foreseeable future.

It is safe to say that ENC's of most high priority areas (e.g. trade hotspots and key ports) will become available in the next few years, but other areas of lower priority could take far longer.

The UKHO is dedicated to an ongoing programme of ENC production, both within its own national waters and in support of other hydrographic nations. To date, the UKHO has released extensive ENC coverage of the UK, Gibraltar, Malta, Egypt (including Suez), the Falkland Islands, and parts of the Caribbean, West Africa and the Middle East.

An electronic catalogue showing commercially available, produced but not yet commercially available and planned international ENC coverage is available from the [IC-ENC](#) website.

The Admiralty ENC Service

As well as UKHO-produced ENC's of both national and foreign waters, the UKHO also provides ENC's produced by other Hydrographic Offices (sourced from Regional ENC Co-ordinating Centres and direct from HO's) within its [Admiralty ENC Service](#). The UKHO has made an ongoing commitment to expand the Admiralty ENC Service in order to provide a single 'one-stop-shop' source for all ENC data and make purchasing ENC's simpler for end users. For further information, including details of available coverage, click [here](#).

ENC Distribution

In order to ensure uniformity in both format and distribution, the IHO created the WEND (Worldwide Electronic Navigational Database) principle. Under the WEND principle, each major geographical area of the world would have its own Regional ENC Co-ordinating Centre (RENC). Each ENC-producing nation would send its data to the local RENC, who would then be responsible for validating and distributing its ENC's to end-users.

There are currently two RENCs worldwide; [Primar-Stavanger](#) based in Norway and the International Centre for ENC's ([IC-ENC](#)) based in the UK. ENC's from both RENCs (and from other non-RENC member nations) are available from leading [Admiralty Distributors](#).

RASTER NAVIGATIONAL CHARTS - RNCs

RNCs use raster data to reproduce paper charts in an electronic format. Their familiar 'paper chart' image helps users gain confidence with the use of electronic charts, by providing a direct link between display screen and chart table.

RNCs (and in deed all raster representations) consist of thousands of tiny

coloured dots (pixels), that together make a flat digital image. Every pixel is geographically referenced, enabling accurate real-time (continually updated) display of vessel position when your chart display system is linked to GPS.

Additional user defined information such as route plans and shoal areas can be overlaid on an RNC to provide automatic links to other onboard systems (e.g. warning alarms) but unlike ENC's, charted features cannot be selectively displayed or queried.



RNC samples taken from ARCS charts BA2036 and BA2675.

RNCs must comply with the IHO's S61 data standard, and can only be issued by, or on the authority of, a government-authorized Hydrographic Office (HO).

RNC Distribution

The UKHO produce [ARCS](#), the world's leading RNC service. Over 3,000 ARCS charts are available, providing worldwide coverage in RNC format of the globally respected Admiralty chart series.



ARCS charts carry the same guarantee of quality and accuracy as the Admiralty paper chart, and are available from Admiralty Distributors worldwide.

HOW DO I USE ELECTRONIC CHARTS?

To display an electronic chart you need either an Electronic Chart System (ECS), or an Electronic Chart Display Information System (ECDIS).

ECS is a generic description that can be used for anything from a laptop with simple navigational software to a fully Integrated Bridge System (IBS). An ECDIS is an official, type-approved display system (more than an ECS) that meets stringent IHO defined criteria.



It is important to note that when used to display non-SOLAS-compliant electronic charts, an ECDIS is classified as an ECS and can only be used as an aid to navigation (see regulations below).

What are the Regulations?

If electronic charts are used as a primary navigational tool (in place of, or in order to reduce the number of paper charts that need to be carried and kept up to date) the combination of charts and display system must conform to International Maritime Organisation (IMO) and national regulatory authority rules.

When displayed within a type approved ECDIS and supported by the appropriate backup arrangements, ENC's can be used to satisfy SOLAS chart carriage requirements, and can therefore be used as the primary means of navigation.

The IMO requires that when using a type-approved ECDIS:

> ENC's can be used for primary navigation in place of paper charts, provided there is a suitable backup (e.g. another ECDIS with a separate power supply, or an appropriate folio of up to date paper charts).**

> RNC's, when used in conjunction with ENC's (to fill the gaps in coverage) can be used for primary navigation together with an appropriate folio of up to date paper charts.**

** What is considered 'an appropriate folio of up to date paper charts' will vary between flag states, and may or may not represent a reduction in the number of paper charts required to be carried.

The information above is provided only as a guideline, there are regional exceptions to these rules. Users must consult their own flag state's regulatory authority (e.g. the MCA for the UK) to find out exactly which regulations govern their electronic chart carriage requirements, as regulations vary.

WHICH TYPE OF ELECTRONIC CHART IS BEST FOR ME?

Both ENC's and RNC's are official electronic charts produced from approved hydrographic office data of the highest quality. Both can be updated automatically on a weekly basis, thus reducing the amount of time the mariner has to spend manually correcting charts.

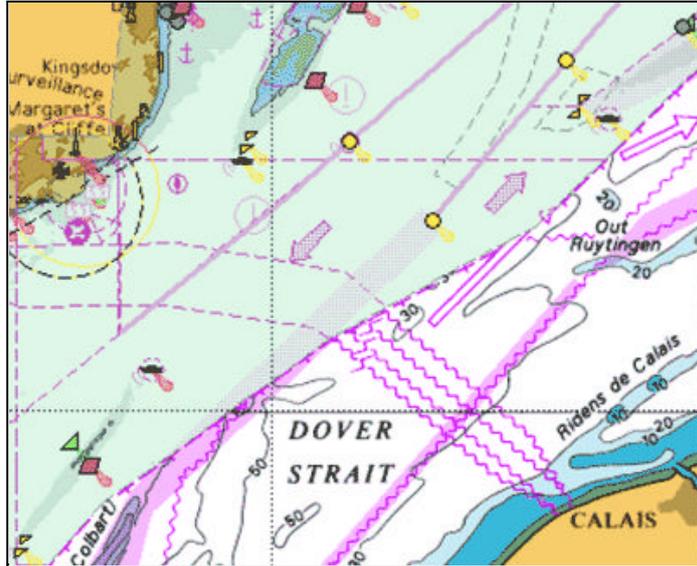
ENC's offer the prospect of paper chart equivalency and more functionality than RNC's, but although ENC coverage is steadily increasing, it will take several years to reach global levels. Due to the relative infancy of both ENC and ECDIS, regulations for their use can vary from country to country and can be confusing.

RNC services such as ARCS already offer worldwide coverage, providing navigators with the safety and operational benefits of official electronic charts virtually everywhere in the world. However, despite the fact that RNC's provide exactly the same data as their equivalent paper charts, current regulations do not support the use of RNC's for primary navigation when used independently of

ENCs, and without some form of paper chart backup.

So What Does this Mean in Practical Terms?

If you wish to navigate using electronic charts as your primary means of navigation you need a type approved ECDIS with back-up, ENCs where available and RNCs such as ARCS charts to fill the gaps. Initially, the ARCS component of this 'dual-fuel' combination is likely to form the majority of coverage, so a reasonable paper chart backup will still be required (but this will gradually change as more ENCs become available).



ENC and RNC being used in combination.

Electronic Charts as an Aid to Navigation

Where electronic charts are displayed within an ECS as an aid to navigation, it is likely that [ARCS](#) will continue to offer the mariner the best overall package for some years to come, because as well as the generic benefits associated with all electronic charts, ARCS also:

- > Is the only service available that provides global coverage of official electronic charts.
- > Is user friendly as it provides an exact correlation between the familiar electronic chart on your ECS/ECDIS screen and the Admiralty paper chart on your chart table.
- > Is a tried, tested and most importantly trusted.

The above benefits have made ARCS the preferred choice amongst many mariners worldwide.

The Future of Primary Navigation

The UKHO is currently conducting sea trials of a new service, designed specifically to provide a 'one-stop-shop' for both ENCs and RNCs. The new [Admiralty ECDIS Service](#) will bring together ENC services from multiple sources including RENCs and other Hydrographic Offices, and will combine them with worldwide coverage of ARCS to provide a single, integrated service that will facilitate full, regulatory compliant use of ECDIS.

Shipping companies subscribing to the Admiralty ECDIS Service will purchase

electronic chart coverage for specific routes or areas of operation. The UKHO will provide ENC's where available and ARCS charts where not, and will automatically issue new ENC's (at no extra cost) as coverage increases.

For the customer, this combined service means no multiple licenses, no multiple CDs, no duplicated costs and no 'blank cheque' scenario as additional ENC's become available within their subscription period. For further information regarding the Admiralty ECDIS Service, click [here](#).

FURTHER INFORMATION

Where Do I Purchase Electronic Charts?

ENC's and RNC's are available from the UKHO's worldwide network of approved Admiralty Distributors. Your Admiralty Distributor will be able to give you detailed information about the Admiralty services available.

Glossary of Terms

ARCS	Admiralty Raster Chart Service
ECDIS	Electronic Chart Display & Information System
ECS	Electronic Charting System
ENC	Electronic Navigational Chart
GPS	Global Positioning System
HO	Hydrographic Office
IBS	Integrated Bridge System
IHO	International Hydrographic Organization
IMO	International Maritime Organization
MCA	Maritime and Coastguard Agency
RENC	Regional ENC Co-ordinating Centre
RNC	Raster Navigational Chart
SOLAS	Safety Of Life At Sea
UKHO	United Kingdom Hydrographic Office

UKHO Helpdesk

The UKHO provides a dedicated Helpdesk facility to help its customers. If you have any questions regarding electronic charting or Admiralty navigational products and services, please contact us using the details below:

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