



# Geodesy and your Electronic Chart

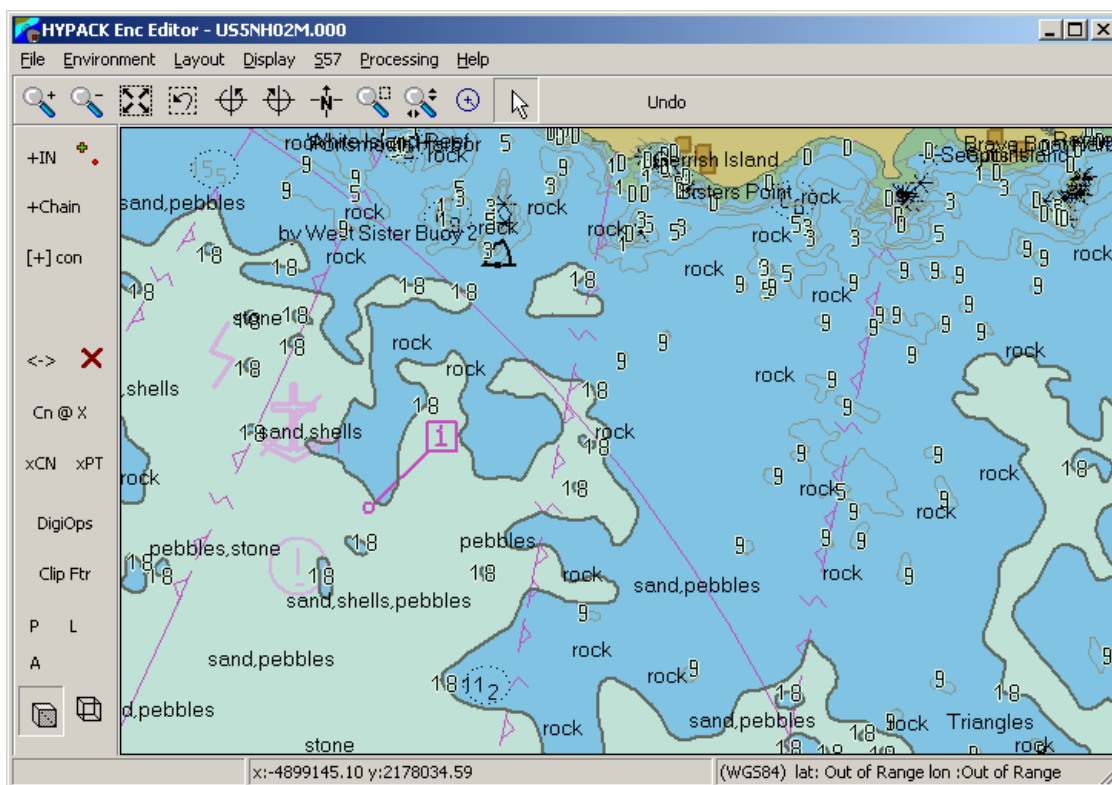
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ENC and Inland ENC charts store coordinates, generally speaking, in WGS84 Latitude and Longitude. This is a benefit to software using the chart as this is a well known geodetic system. If a given software were to manipulate data in this coordinate system, it could import the spatial points either directly or easily convert them using a simple transformation. HYPACK®, in contrast, works almost exclusively with projected data for all operations such as data collection, chart display and data editing.

What this means for your electronic chart is that the spatial data contained within must be projected from the WGS84 system to an XY system before it can be displayed as a background chart or edited in the ENC EDITOR. To accomplish this task, HYPACK® uses the active project's geodesy. The GEODETIC PARAMETERS program is the visual interactive front end for your project geodesy. The information specified here both defines your local system and provides the equations for translating points to and from your local projection and a latitude/longitude system.

Local projection systems tend to be optimized for various properties, like angle or size preservation, and tend to be accurate only over a portion of the earth. This is fine as the work area of interest is normally localized, not world wide.

FIGURE 1. Sample Chart in the ENC EDITOR



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Now given that electronic charts are in WGS84, that HYPACK® works in projected XY, and that projections have localized extents, you may find yourself in a situation similar to Figure 1. The chart pictured covers a portion of New Hampshire, U.S.A while the geodesy is set for the UK National Grid. In the status bar we can see indications of a mismatch in that the XY coordinates are quite wild, and the lat/ lon fields are both displaying “Out of Range”.

The Out of Range message is telling us that converting from XY to Lat/Lon is not possible at a given point. If the conversion is not possible, then it follows that saving the chart is also not possible as it must be in stored Lat/Lon. This is a situation to watch for. It arises from the fact that our geodetic engine may be able to project Lat/Lon points to your local system and give what appears to be a meaningful picture yet, at the same time, be unable to *un*-project those points back to Lat/Lon.

If you skipped to end, here is the important thing to take away from this article: When editing electronic charts in the ENC EDITOR, move your mouse around the extents of the chart you are creating or modifying. If you encounter an “Out of Range” display, adjust your geodesy before editing or trying to save your work.