

# KEEP TRACK OF CHART DATUM

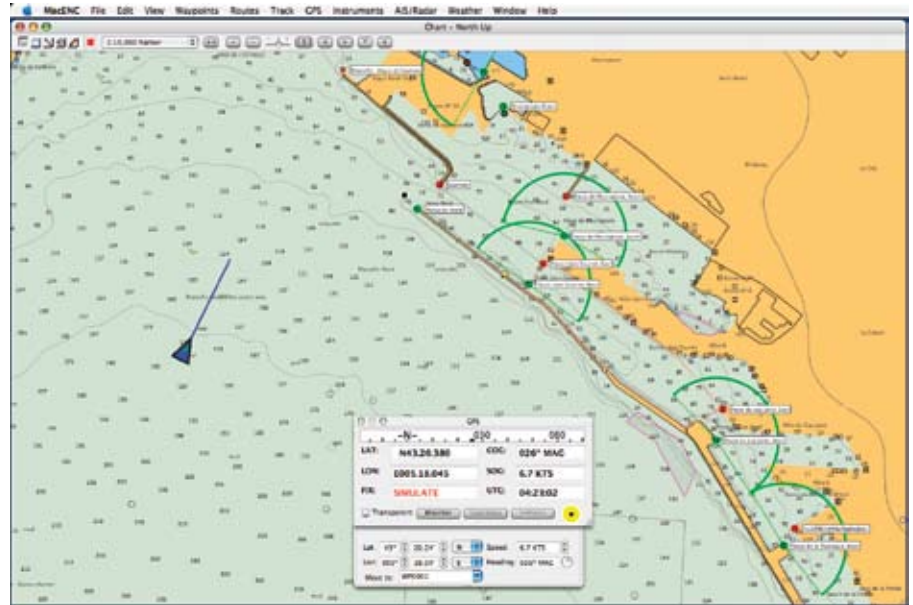
*Blindly swapping waypoints can put safe water where rocks and ledges lie lurking.*

Charts are available in two broad categories: raster and vector. Raster charts have been available longer, and are created with exactly the same digital data used to create the paper charts that they represent. (Raster charts are often made by scanning paper charts.) As a result, raster charts have a fixed resolution. When zooming in or out of a geographic area that is shown on multiple charts, navigation software selects the chart with the most appropriate scale factor. Because raster charts contain every printed dot of a paper chart, whether the dots contain useful information or not, a set of charts for a region like the east or west coast occupies hundreds of megabytes of disk space.

Vector charts consist of a large number of connected data points drawn as lines and referred to as vectors. Vector charts consume much less disk space, and often have layers of information that can be turned on or off. Vector charts are easier to search. Recently, NOAA made a complete set of vector charts for U.S. waters available to the public at no charge. Raster charts have been available for over a year.

"The more watches you have, the less sure you are what time it is." Each watch has its own error, and so how would you judge which watch is most correct? The same problem occurs with charts; there are many sources for chart data, all of varying accuracy. Chart data providers do not offer equal accuracy for all geographic areas. Not only do navigational features change, some areas of the world have never been accurately surveyed.

PS routinely receives reports of erroneous positions found on digital charts from every manufacturer. In our recent digital chart test ("Electronic Charts," April 2006), we saw this firsthand. Many of the inaccuracies may be found on printed charts as well. The old navigator's dictum,



*MacENC is unique in its ability to read S-63 encrypted charts. This French chart shows an approach to Marseille, France.*

to not rely on one sole source for navigation, applies here.

Chart vendors obtain their raw data from various suppliers, massage it in various ways, and provide charts to the public in a variety of formats. Navigation software, GPS units, and chartplotters often have specific formatting requirements. Most navigation products come bundled with a set of charts that customers can augment by purchasing more charts of the appropriate format.

Charts display several types of data. Raster charts have one layers, which cannot be re-scaled. Vector charts, with their multiple layers, are more versatile. Some software won't let you overlay a vector and a raster chart of an area simultaneously. Types of chart data includes:

**Shoreline:** Only Fugawi allows you to draw new vector outlines.

**Depth (bathymetric):** Some programs (like MaxSea) allow you to augment this data as you travel.

**Topographic:** Useful when viewed from a horizontal view so you can see what the approach to a harbor should look.

**Features and locations:** Most programs allow you to add new locations, and many allow you to categorize the location data.

## **Satellite images and aerial views:**

Often helpful in conjunction with vector displays, but can consume a lot of disk space.

**Weather data:** Provided from online services. Manufacturers of navigation software vary widely in the options they provide in this regard. Mid-priced Rose Point and Maptech provided excellent support, hourly snapshots up to 13 days in the future at no charge to users of their software. Nobeltec charges for forecasts more than three days in the future, even though the source of this data is NOAA.

**Photographs:** Some chart providers, such as Maptech, include a photographs, of certain areas. Many navigation software programs allow you to associate your own photographs with chart locations. Vector charts are most commonly provided in S-57 format; this is the format that NOAA makes available at no charge for U.S. waters; the Army Corps of Engineers also uses this format for their iENC (Inland Electronic Navigation Charts) of rivers. Outside of the U.S. most vector charts are only available for a fee, and these charts are usually encrypted with the S-63 protocol. The only marine navigation program we tested that was able to read S-63 encrypted vector charts was MacENC.