

How to fit an elephant on a 19-inch screen



With quicker updating, automatic positioning and more straightforward

course laying, electronic charts outshine paper ones in many respects. But not all. One of the most debilitating factors of contemporary electronic chart display system is the limited screen real estate.

The navigator can never really visualise the whole chart. His viewport is always constrained, as if he were peering into a room through a keyhole. To see the room in full, he needs to keep looking around and build up a mental image to supplement the limited area that is actually visible on screen at any given moment.

What can be done? It is not beyond the imagination that one day in the not-too-distant future bridges will be furnished with cinema-tastic wrap-around widescreens, boasting augmented reality displays over the

Traditional nautical charts were printed on durable paper measuring 25 by 40-inch, a size denoted historically as 'half a double elephant'. But how long until electronic charts can be displayed in their full elephantine glory?

window. But until that day comes, a more down-to-earth pragmatic approach is called for. In other words, to use what real-estate is available to maximum advantage. Or so says Simon Salter, sales manager at CherSoft, the developers responsible for Nuno Navigator and other navigational software.

'With Nuno we have done a bunch of things to compensate for the lack of screen size,' says Salter. 'To begin with, we avoid dislocating affordances. An affordance is something which by its appearance invites user interac-

tion, such as on-screen buttons and sliders. It is a very important concept in user interface design. When you want a computer program to do something, users will seek out affordances – graphical elements that can be pressed, dragged, selected etc. For seasoned users, this happens almost subconsciously.'

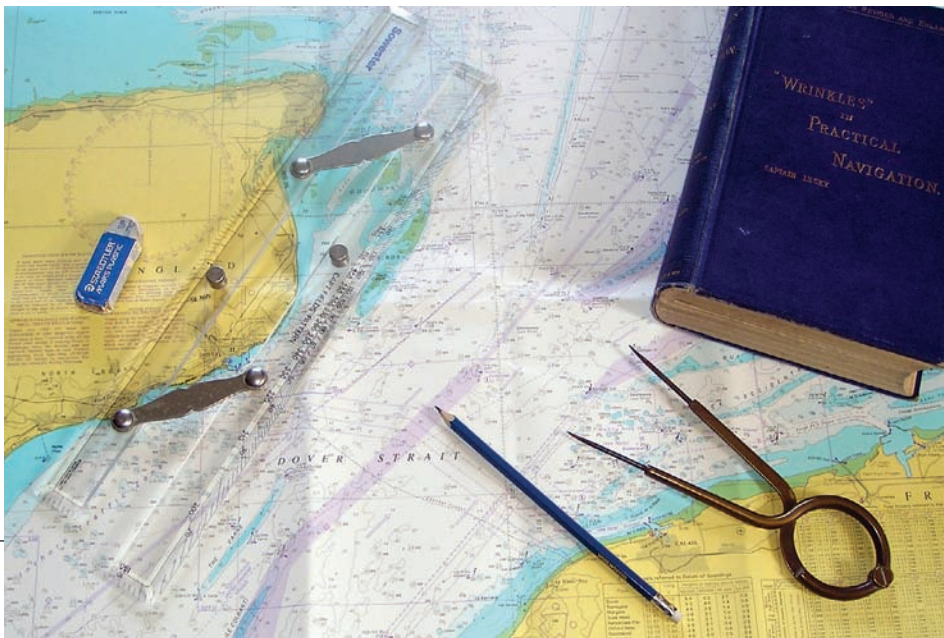
Avoiding disorientation

A dislocating affordance is one which causes the whole screen to change, such as a control for making the chart view jump. Salter likens this to spying through the keyhole, closing your eye, changing position and then looking again. 'You are suddenly presented with a different part of the room but you don't really know how it joins up to the part you were viewing moments before. To maintain a sense of continuity, it is much better to allow a smooth transition from one view to the other by panning and zooming etc.'

Nuno also dedicates as much screen real-estate as possible for displaying the actual chart by not reserving huge swathes for control panels. (The user can set up these panels but they are not imposed as a default). 'Many of the affordances are arranged around the screen in fixed positions so that you will always know where to find them but they become translucent when not being used. They obscure the chart a little bit but you can still see chart and we think the more chart you can see the better,' says Salter.

With vector charts the view differs from a traditional bounded

▼ Paper charts do not suffer from a limited viewport, but clutter can sometimes be a problem



Conrac unveils 46-inch tabletop chart display

paper chart. Instead it is like an enormous cylinder on to which the world is projected. If you keep panning right you will eventually come back to where you started. This means that however big the screen, the user will still need to pan and zoom.

To display an image of a paper chart on a screen at about the same size as the original you need about 100 dots per inch (dpi). Less than this and the image will be blurred. More than this will result in a sharper, clearer image. Paper charts are typically printed with at least 600dpi, but it is difficult to obtain such high definitions on a screen image. So 100 dpi is considered to be reasonable a compromise.

Elephant evolution

So what, in Salter's view, is the best size for a screen? 'You need to be able to see it all without having to walk around. In fact if you could reach across to any part of it then that would be good. Maybe this problem is already solved. Maybe a paper chart has evolved to be just the right size. Maybe in 200 years of making charts we have actually come up with something that is just the right size for the job.'

'Now the standard size for a full paper chart is a half double elephant. This is not, as you might logically deduce, the same as a single elephant. The elephant folio is up to 23-inches tall whereas a double elephant is 50-inches. So the paper chart, at around 25 by 40 inches is in fact a half double elephant.'

'A screen this size would need to 5000 pixels wide. At the moment the best mainstream video standard is dual channel DVI which supports up to 2560 x 1600. So four of these lashed together could look pretty good. A company called Cinemassive make a set of monitors like this. EyeVis have some pretty good single screens 64-inch 4096 by 2160 – not quite enough pixels and a rather eye-watering price. However we are certainly heading in the right direction.'

GERMAN INDUSTRIAL display manufacturer Conrac used Nor-Shipping as a platform to showcase a variety of its widescreen marine panel computers. The latest and most impressive addition to the range is an extra large 46-inch display, with integrated touch interface, intended for use as digital chart table.

At the opposite end of the scale is a small panel PC – also touch screen enabled – for embedded applications. Conrac states it is ideally suited to ship automation functions and maybe as a 'captain's chair display'.

Elsewhere it demonstrated a 38-inch 'stretched' format display. The somewhat unusual 16:4 aspect ratio results in a screen approximately equivalent to a conventional screen sliced horizontally across its middle. Of course, says Conrac, this makes it suited for applications or installations constrained by strict height restrictions. Though, exactly what these applications might be remains unclear.

Last but not least, Conrac presented its almost frameless narrow bezel displays, which can be used as stand-alone units or joined together in a cluster. The latest enhancement made here is the Display Performance Monitoring for managing the configuration of screens installed in a large network or in disparate locations.

Further, despite the almost frameless design a special sensor has been integrated in the front bezel, which continuously monitors the panel's operation (backlight, inverter, power supply and interface).

► The 46-inch display, with touch interface, could be used as a digital chart table



Getting touchy feely

While extra large screens might solve one problem, they create others, suggests Salter: 'Your poor old mouse is going to run out of steam. You would need a mouse mat four times bigger unless you could manage to move the mouse four times more precisely.'

But maybe mice are redundant. If the screen were set up as a traditional chart table – the temptation would be to reach out and touch it. Elaborates Salter: 'Multi-touch technology is really starting to gain pace now. Once you get to grips with an Apple iPad you soon find it is a great way of

doing things. Microsoft Surface is another pioneering touch interface, which also benefits from a large form factor, having been designed from the outset as a table rather than tablet. Sadly for now it doesn't have enough pixels, but it offers a tangible indication of the direction of things to come.'

Although Salter admits that screens the size of a chart table will not suit every vessel, the technology is edging closer to commercial reality, especially as displays become lighter and cheaper. Indeed, Nuno is already looking at a project to prototype a full sized electronic chart table along these lines. 