DIGITAL BRIEFING

JEPPESEN ELECTRONIC CHART CLINIC
SIXTH IN A SERIES

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Electronic enroute charts are here today. There are improvements that will make them even better in the future. When looking at the future, it is very difficult to predict what we will be using 5, 10 or 20 years from now. Here is what some of the true giants of the computing industry have said about the future of computing:

"I think there is a world market for about five computers." Thomas J. Watson, Chairman of IBM, 1943.

"There is no reason for anyone to have a computer in their home." Kenneth Olson, President of Digital Equipment Company, 1977.

"640K RAM ought to be enough memory for anybody." Bill Gates, CEO of Microsoft, 1981.

In this article, we continue to look at electronic enroute charts, as they are today rather than how they will look in the future. We wish our "crystal ball" was very clear, but right now we can only speculate about what we will see in hardware, software, data and displays in the next generation.

Flight Planning with Electronic Enroute Charts

Electronic enroute charts are now more than "just a pretty face." There is intelligence behind each image you see on a screen. And each image has a connection to other images on the screen. As an example, each airway is electronically connected to the navaid at the end of each airway. Also, each intersection on the airway is connected to the airway. Further, each airway is connected to the minimum altitudes for each segment.

So what does this mean to you?

For flight planning purposes, everything is connected so that any automatic routing will connect your departure airport to your destination airport via intersections, VORs, and airways when you elect to fly via the airways. If there is a turn at a VOR required to create the most efficient route, the connections will automatically be made. Since the data is electronic, the end result will also be a navigation log with all the VOR frequencies, leg lengths, airway minimum altitudes, etc. which provides a lot of intelligence for making decisions upon whether or not you want to fly via the computed route.

Removing Information

With an electronic chart image generated dynamically from a database, each class of element can be displayed or it can be turned off. As an example, you could turn off all the NDBs if you were on a GPS direct route using the electronic enroute chart in flight. The more information that is turned on, the more potential for "clutter" to be on the screen - the more that is turned off, the easier it is too see what's really important for your particular flight.

A paper chart is not the same as an electronic chart. When you look at a paper chart, all the information is arranged in such a way so that important information is not printed on top of other important information. A cartographer sitting at a desk with lots of time and experience has made the decisions for the placement of all the information.

The intelligence of a cartographer sitting at a work station just cannot be duplicated today with computers (at least not for a reasonable cost). When a new area is viewed on an electronic chart, the computer has to make many, many decisions on the proper placement of each item. Sometimes when the conflicts are just too great, the computer makes difficult decisions that are different than those a human would make. For example, some information might just get eliminated from the screen. Because of the computer's decisions, it is frequently best to turn off information that is not needed.

On a GPS direct flight, airports and VORs might also be considered for elimination since they can be turned on quickly if you need to know about airports along your route. On GPS flights, one of the more important pieces of information to leave displayed are the restricted areas, prohibited areas, and other areas that should be avoided. Each of these categories of information has its own "button" on the control bar, allowing it to be quickly turned on or off.

Vector Chart Themes

During most of my flying, I filed IFR flight plans even when the weather was CAVU. It is a good way to be in constant contact with ATC, and it keeps you current with copying clearances and conforming to IFR procedures so that when the weather is genuinely IMC, it is nothing out of the ordinary.

This means always carrying IFR enroute charts plus the appropriate terminal procedures for each flight. Additionally, I always carried Sectional Charts with me for both my passengers and myself. For passengers, it is a good way to get them involved in what is happening and it typically makes for more contented passengers. Then, when a large city or body of water comes within sight, you can look at the Sectional Chart and know where you are.

With electronic enroute charts, the "look and feel" of the chart can be changed depending on what type of information you want to see. As an example, the electronic chart can look like an IFR low altitude enroute chart, a high altitude chart, a VFR chart, or a number of other charts. While flying a GPS direct route, if you spot a ground feature you want to identify, you can turn on the vector theme for VFR charts and all of the things you are used to seeing on the Sectional Chart appear on the screen. Try that with a paper IFR chart!

In the illustration, the area around Wenatchee, Washington appears in a VFR vector theme.

Track Up versus North Up

Flying south? If you are flying south along the river toward Wenatchee, the airport would be to your left. But if you look at the VFR chart with the north at the top, the airport is to the right of the river. Confusing? Sometimes it's just easier to turn the chart upside down so the top of the chart is south when you are flying south, then everything will appear in its proper orientation.

With electronic charts, you can set the display to read "track up." Assuming your electronic chart is connected to your GPS or FMS, this means that the top of the enroute chart will always be the view out your front window. Now things to the right of the airplane appear on the right side of the chart display. With charts that are dynamically generated from a database, this means all the text is also generated "on the fly." The good news is that the text will always be "read right" so it will not be upside down when the chart is rotated with the front end of the airplane.

In the next article, we'll begin looking at the plans the FAA has for the level of certification they expect for various types of electronic chart installations.

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