iPad Apps Versus PC-based Solutions

by Steve Podradchik
CEO, Seattle Avionics

At Seattle Avionics, we get asked almost every day how the Apple iPad compares to PC software and, in particular, to our SkyPad^2 EFB. We're in a unique position to answer that because we supply our ChartData™ aviation data to every major iPad application as well as produce the SkyPad^2 EFB. Since we support both the iPad and the SkyPad, we're not really biased one way or the other (well, maybe a little) but the differences between the systems are real and you need real info, not just hype, to make an informed decision.

iPad Overview

The original iPad was a great device and the new iPad 2 is even better. I love my iPad (still have the original model) and use it frequently. My family also loves it for playing games, reading eBooks, and watching movies during long trips. It's quite popular for aviation, but, like all other electronic solutions (including our SkyPad), it's not perfect.

The iPad 2 has a 9.7 inch display in a somewhat more "square" form-factor that most tablet PCs (1024 x 768 pixels). It weighs about 1.3 lbs and is 1/3 an inch thick. It comes in both "Wi-Fi only" and "Wi-Fi + 3G" versions but only the more expensive "Wi-Fi + 3G" models include a GPS. The iPad 2 is much faster than the original iPad but speed really wasn't a problem even with the original model.

The iPad has a standard laptop-type LCD screen (unlike eBook readers) with great touch capabilities. And, of course, there's a wide variety of apps available for it, including many good aviation ones.

In other words, it's light, thin, and easy to use -- great things for cockpit use. But it's clear that the iPad wasn't designed specifically for in-flight use:

- It's a little "wide" relative to most tablet PCs. That makes it hard to fit in a yoke mount on many planes. Not impossible and RAM makes mounts but check the width carefully.
- The GPS is not WAAS-enabled and, honestly, much better at finding the nearest Starbucks than the nearest approach fix. You also need the higher-end models (the "Wi-Fi + 3G" versions) to even get a GPS. A small number of 3rd party external GPS units have just become available but they all have serious drawbacks (either sticks out the bottom of the iPad, ripe for getting snapped-off, or uses Bluetooth but no WAAS).
- It can overheat in bright sunlight as it has no fan. When it overheats, it shuts itself down. Obviously this is more of an issue in some areas of the country than others.
- Cannot connect to an XM receiver for in-flight weather.

ChartData

One of the best things about the iPad is the ability to "test-drive" many different applications, often for little or no charge. But no one wants to buy data for one application then, when you try another application, have to buy the same data again. Here's where our ChartData subscription comes in. With iPad ChartData, a subscription for one supported app also works on other supported apps so your investment in ChartData is safe. The only exception is ForeFlight which uses our IFR ChartData as part of their ForeFlight HD Plus package so the subscription is not portable to other apps.

There are a few caveats. All of these apps use our IFR ChartData ($99 / year) but only one currently uses our VFR ChartData. The apps that don't use our VFR ChartData, typically require purchase of application-specific data packages (the app vendors do have to stay in business, too). There is also the chance that, in the future, other apps will incorporate our ChartData but not allow portability (for example, ForeFlight).

We're often asked if a Voyager ChartData subscription (especially our Lifetime subscription) is portable to the iPad. Unfortunately, the answer is no. iPad data is formatted differently than what Voyager uses. Moreover, as you might imagine, we share the revenue from selling iPad ChartData with the iPad application vendors. We do, however, offer substantial discounts when you purchase a combined subscription to both Voyager (normally for flight planning) and an iPad application.

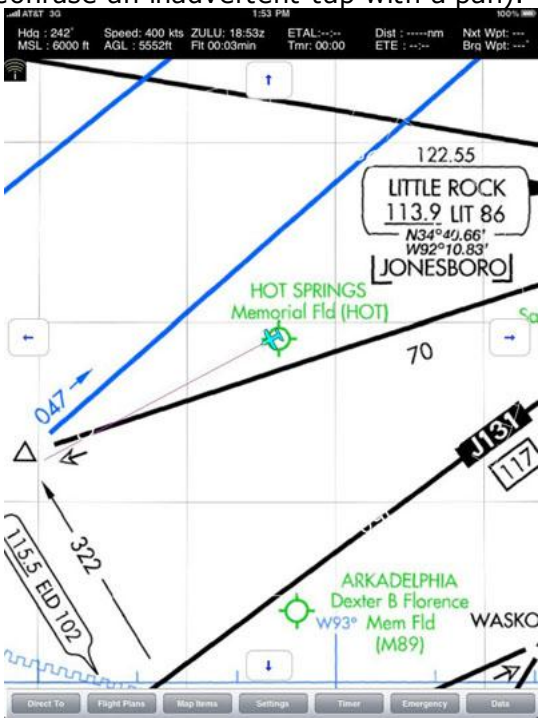
Apps

Perhaps the best thing about the iPhone and the iPad is how Apple has worked to make thousands of applications (called "apps") easily and inexpensively available. Apple says that more than 250,000 apps are now available that were either designed specifically for the iPad or work fine on the iPad (that is, were designed for the iPhone). That's an impressive number. But, just to keep things in perspective, there are *millions* of Windows applications. A quick look at the Apple App Store is even more telling: 7 of the top 10 paid-for apps are games. The other three are related to word processing or presentation graphics.

Of course, we're not here to talk about word processing. We'll focus on the aviation apps that use our ChartData, listed in alphabetical order.

Beacon

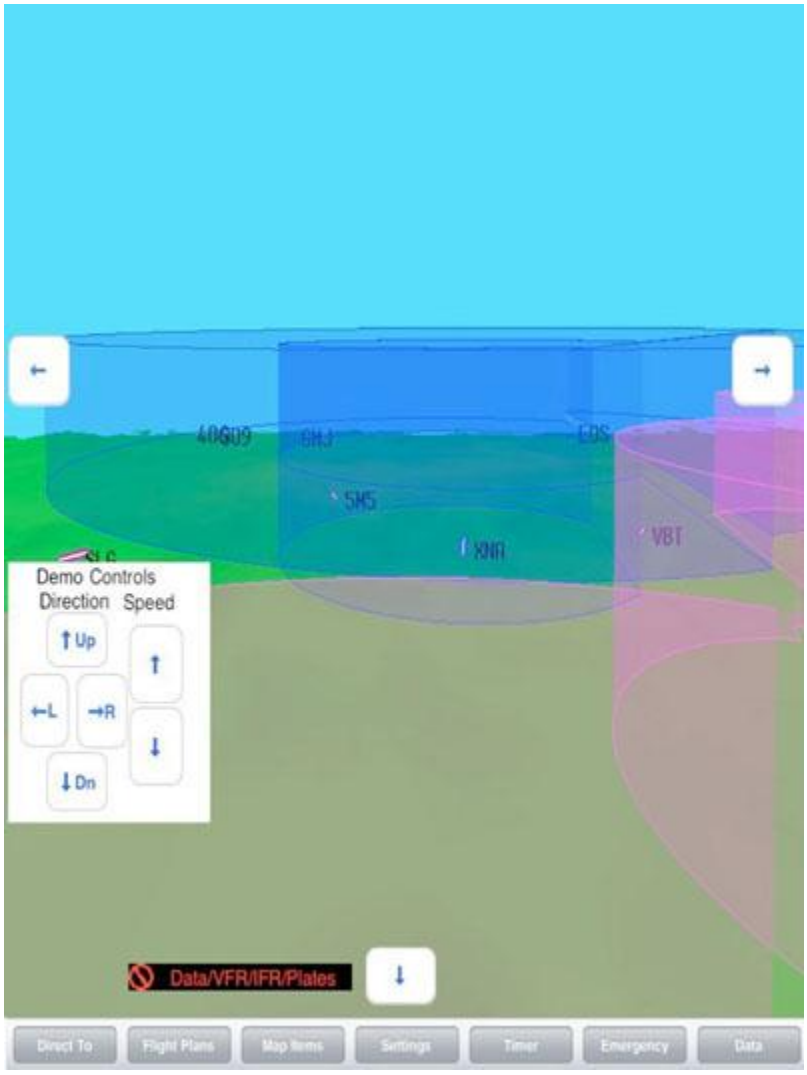
Beacon is a new moving map application designed specifically for the iPad. The developer, Zivosity Software, put a tremendous amount of effort into making it work ideally in the cockpit, even sometimes not following standard Apple user interface guidelines where they didn't feel they worked well in the cockpit (for example, you can "pinch to zoom" in the normal way but panning (scrolling) the map takes a three finger gesture so as not to confuse an inadvertent tap with a pan).



Beacon uses all of our ChartData so one subscription from us provides everything you need (unlike the other two apps listed here which require a "base" subscription from the app vendor plus our ChartData subscription). With a VFR subscription ($99), you get digital airport/navaid/etc. data and our seamless Sectional charts (effectively one gigantic Sectional chart, exactly as the FAA lays it out, that goes seamlessly from Seattle to Miami). With the VFR + IFR subscription ($199), you get all of that plus geo-

referenced approach plates and airport diagrams for all 50 states and seamless IFR Low and High altitude charts that cover all 50 states plus most of Mexico and all of the Caribbean and Central America.

Like most iPad aviation apps, Beacon has one display area. Using buttons at the top of the screen (similar to Voyager), you can quickly toggle between digital charts, seamless Sectionals, seamless IFR Low, etc. You can add TAWS (terrain coloring that tells you when you're below the nearby terrain) by using the Settings button at the bottom of the screen. Uniquely for iPad apps, you can also choose between 2D and 3D charts (3D terrain only, not true Highway in the Sky).



Weather and TFR info is automatically downloaded from the Internet and stored for use during flight. Nexrad radar can be displayed semi-transparently over any chart. There is no capability to get live, in-cockpit weather as you cannot connect an XM receiver to the iPad.

Perhaps because it was made solely for in-flight use, Beacon has some unique and helpful in-flight features. These include flight timers, an Emergency button that brings up a CDI and emergency info, alerts for fuel pumps and landing gears, etc.

Like all the apps here that use our ChartData, Beacon can show approach procedures and airport diagrams and display your aircraft's position over them as you fly. This is called "geo-referencing." This feature and the seamless IFR charts require the VFR + IFR ChartData subscription level.

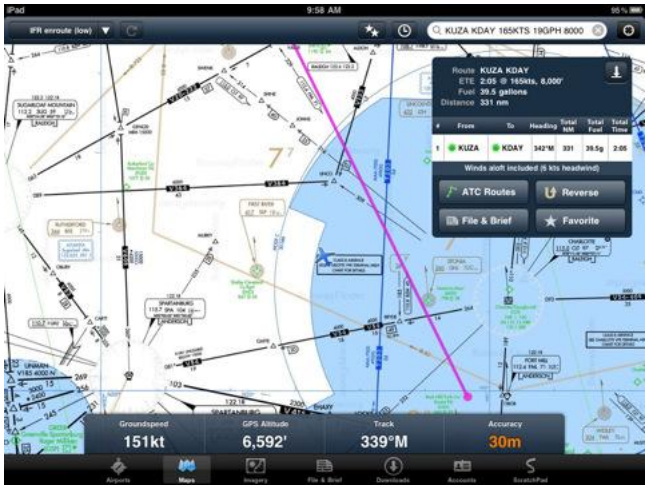
Beacon is extremely customizable. You can select which "layers" appear on the charts (the Map Items button), change the info fields at the top of the screen (Voyager's Gauges), set custom times to switch the tanks, etc. A demo mode, akin to Voyager's GPS Simulator, is available to practice using the app before an actual flight.

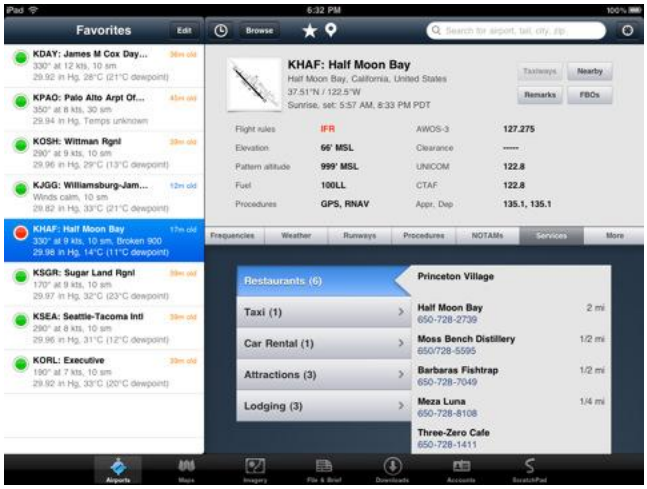
ForeFlight

ForeFlight is perhaps the single best-known aviation app for the iPhone and iPad. It's very popular app for a good reason — it's very easy to use.

It's useful for both pre-flight and in-flight use. That is, ForeFlight (and WingX described below) is useful even if you don't have a GPS because it excels and looking up and displaying airport information, approach plates, maps, etc. If you have a GPS, either an iPad with an internal GPS or are using a 3rd party GPS, ForeFlight displays your plane's position on both maps and, when using our ChartData via their ForeFlight HD Plus data package, on approach plates and airport diagrams.

ForeFlight HD (the version for the iPad) uses the standard iPad interface of having a tab bar across the bottom of the screen that gives quick access to the major functions: Airports, Maps, Imagery (weather images), File & Brief, Downloads, Accounts, and a Scratchpad.



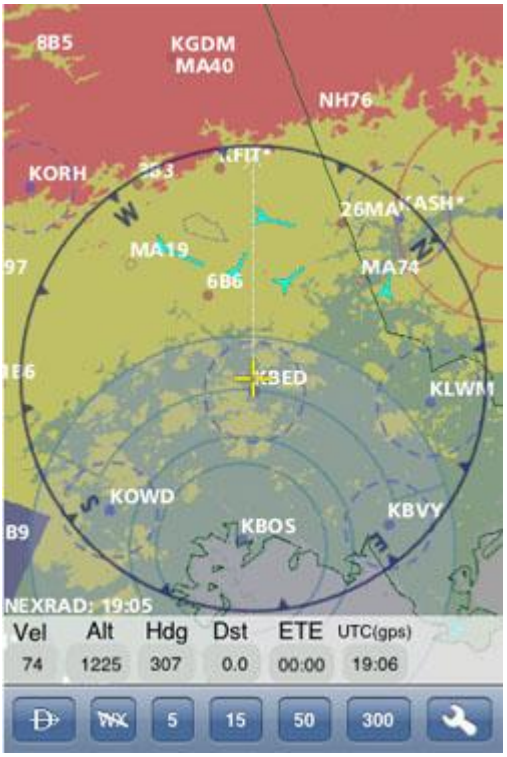


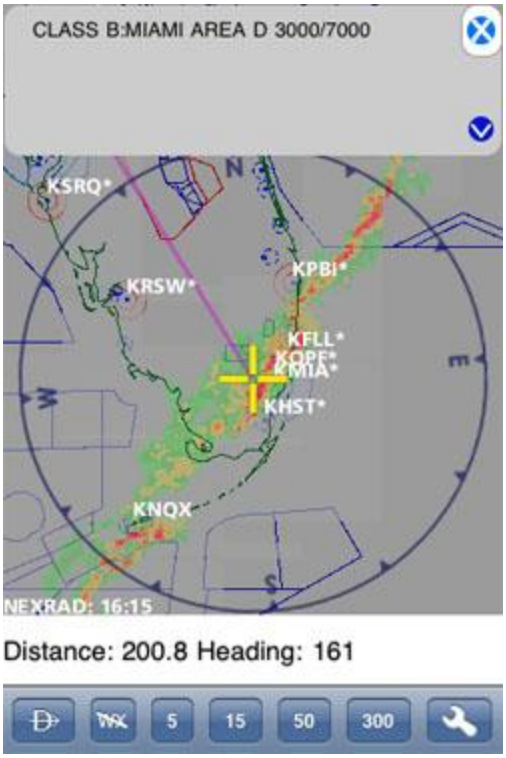
Unlike most of the other apps here, ForeFlight exclusively uses scanned charts to display maps. That is, it has no concept of "digital" charts. However, it can superimpose timely digital information over any chart such as radar, fuel prices, etc. Since you can't download these scanned charts while flying, ForeFlight has easy ways to download just the scanned charts you need for the state or states you fly in.

SkyRadar

SkyRadar, from Radenna Software, is aviation moving map software with a huge, (almost) unique feature: it can retrieve and display live weather information while flying. It can also warn you of traffic in real time.

It accomplishes these seemingly impossible tasks by bypassing the current XM weather standard and jumping directly into the world of ADS-B. In case you haven't kept up on the latest in aviation acronyms, ADS-B stands for Automatic Dependent Surveillance - Broadcast. This is a new technology currently being implemented by the FAA across the US that allows pilots in the cockpit and air traffic controllers on the ground to "see" aircraft traffic with much more precision than has been possible before. ADS-B also broadcasts real-time weather information to pilots. Best of all, access to ADS-B data is provided free of charge. Just purchase an ADS-B receiver, such as the SkyRadar Receiver, and you're good to go with no monthly subscription charges.





In addition to live weather in the cockpit, SkyRadar can also download weather from the Internet, similar to most other apps.

SkyRadar displays crucial situational awareness information towards the bottom of the screen (groundspeed, altitude, etc.) and lets you select which layers to display on the chart. Charts can be displayed in either Track Up or North Up orientation.

Using a Seattle Avionics ChartData subscription, SkyRadar displays your ship's position on approach plates and airport diagrams as well as Low Altitude and High Altitude IFR charts.

WingX

WingX, from Hilton Software, was one of the first iPad aviation applications available. This isn't surprising since WingX has been around for several years on the iPhone, Android, BlackBerry, and even Windows Mobile. Over the years, WingX has considerably expanded in capabilities and been refined many times over.

WingX is often called the "Swiss army knife" of aviation because it includes a wide variety of tools and services including a moving map (more on that below), full airport info, approach plates (geo-referenced with a Seattle Avionics ChartData subscription), basic route planning, weather downloaded from the Internet, FAR documents, and a variety of E6B-type calculators.

Unique among iPad apps, WingX can display either a single full-screen map or a split-screen that shows a map and an approach plate/airport diagram or two maps.

Your flight plan (called a Route in WingX) is toggled on or off the screen with the Route button. The Screen button toggles between single and split screens.

The very latest version of WingX (WingX Pro 7, version 5.0) is a major updates with many new features, the two most obvious of which are true FAA scanned Sectional and IFR charts to augment their existing digital charts and the ability to get real-time, in-the-cockpit weather via an ADS-B receiver. Take it from me, the scanned charts look great (I am a little biased since they are our scanned charts).

SkyPad^2 Slate

The iPad is a good choice for aviation use but, like everything, has limitations. Luckily our world is filled with choices so Seattle Avionics offers a Windows 7 tablet, called the SkyPad^2, that incorporates everything we've learned in eight years of making aviation safer, easier, and more affordable.

First, a little history. Back in the Dark Ages of aviation (before 2009), you could buy aviation applications for your laptop, add a GPS, and you had a poor-man's moving map. Problem was, it was a bit hodgepodge and took more geek-work than some people like (those of you with actual lives). While we sold our Voyager software for such brave souls, we found our tech support lines were sometimes overloaded, mostly with basic Windows questions. Fact is, it wasn't so much a Windows issue but problems caused by the myriad of junk (let's call a spade a spade) that most PC vendors kindly pre-install for you (they were paid by the application makers to add them). And how about all those toolbars and "helpers" that came along for the ride when you installed something useful?

Our solution in mid-2009 was the SkyPad, a solid tablet PC that we carefully tuned to run Voyager well. That means we started from a clean Windows configuration, not the version that came on the machine, added just the pieces we needed, and made everything run smoother and start faster. The result was immediate. While I won't say this magically solved every issue, our technical support lines suddenly became much, much quieter.

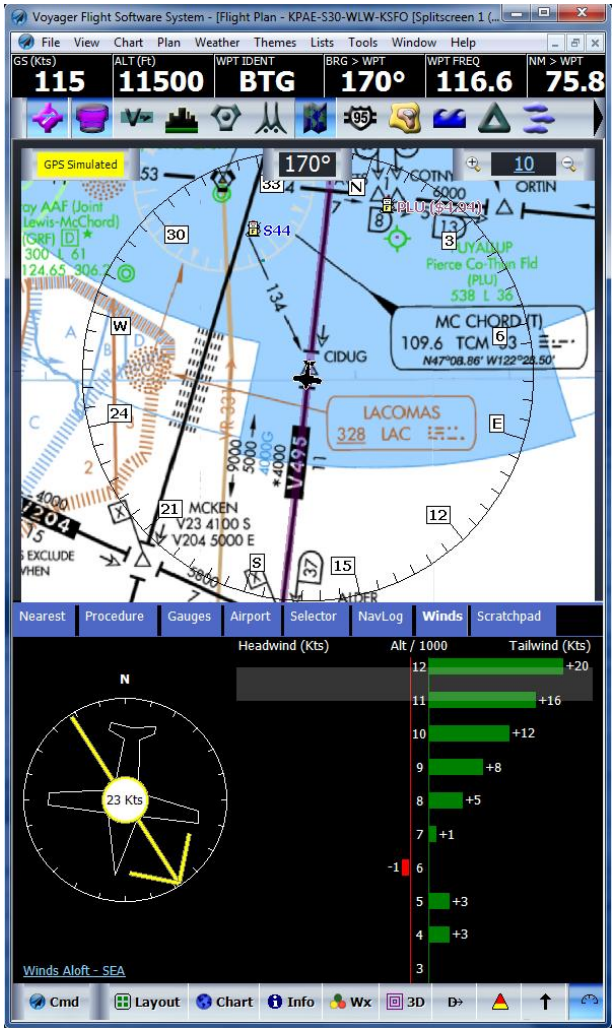
During 2010, we took a look at the shortcomings of the original SkyPad and came out with the SkyPad^2 based on faster hardware, improved software, and a newer version of Windows. The SkyPad^2 sold even faster than the original SkyPad.

And now, we introduce the SkyPad^2 Slate. The hardware is very similar to the original SkyPad^2 with one very large difference -- it's sleeker because it has no keyboard, similar to an iPad. While calling it a "Windows 7 iPad" isn't really doing justice to the iPad, the new SkyPad^2 Slate hardware is pretty impressive in its own right and can run all the business apps, like Microsoft Office, you need.

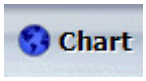
Voyager - the Heart of the SkyPad^2

Aviation vendors often focus on the hardware. It's easy to do since you can measure hardware in terms of megabytes, pixels, and gigahertz. But it's really not the key issue. Day in, day out, it's the software you're using. Providing the hardware and operating system can run the software, the features and ease of use of the software are the important parts. And, in the case of the SkyPad^2, that's good because the heart of the SkyPad^2 is our award-winning Voyager.

Every aviation application in the world shows a moving map. What differentiates the SkyPad^2, because of its Voyager software, is that it turns the little computer into something more akin to an entire glass cockpit with a moving map, an FMS, sophisticated weather analysis, wind-optimized flight planning and more. And yet, it's easy to use. It is helpful if you spend a little time getting to know the system but, once you get the hang of it, you'll find that it's incredibly efficient to get the information you need. With fewer screen clicks, you have more time to actually fly the plane, according to *Aviation Consumer*.

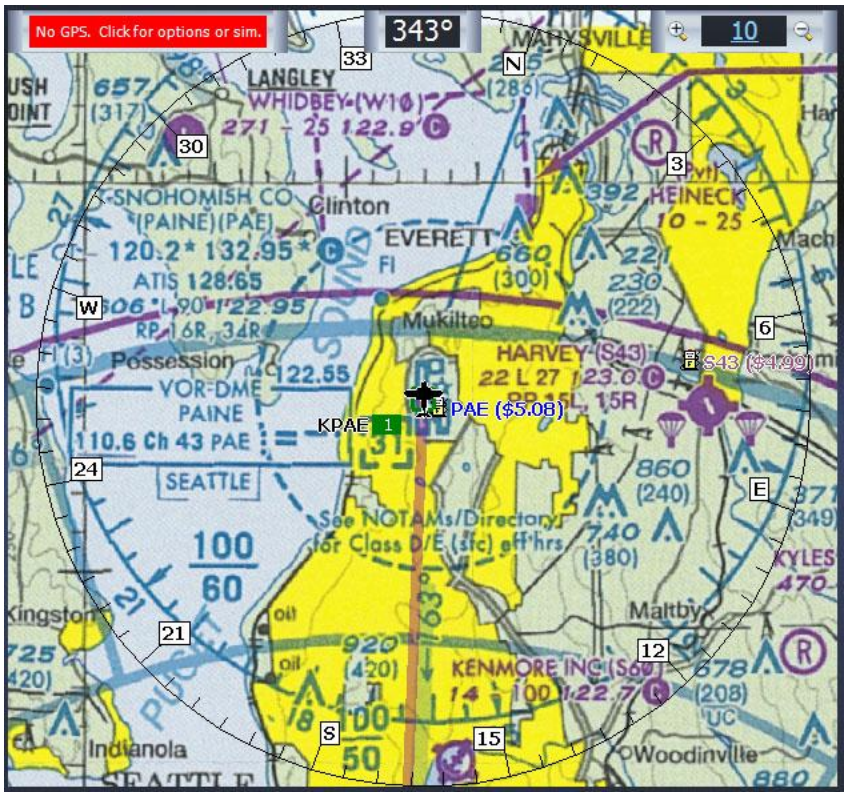


Widgets. It's a funny word with serious power. The Voyager screen is broken into one or more regions that contain what are essentially different flight instruments. Just one click moves between them. In some screen layouts, you can see more than one widget at a time. These include the Chart (map), Airport Info, Wind Optimizer, NavLog, the Scratchpad, and more. Combined, the widgets are the core of Voyager.

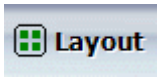


Chart

The Chart is the most obvious element of a moving map application. The SkyPad^2 lets you quickly pick the chart you want, digital or "scanned." Click the Chart button at the bottom of the screen and, in just one more click, instantly select your choice of digital charts, true seamless Sectionals, seamless IFR Low Altitude or seamless High Altitude charts.



Want to modify the chart? No clunky menus or dialog boxes. Tap the ChartBar to add or remove the layers you want. Simple.



Single Screen or Split Screen

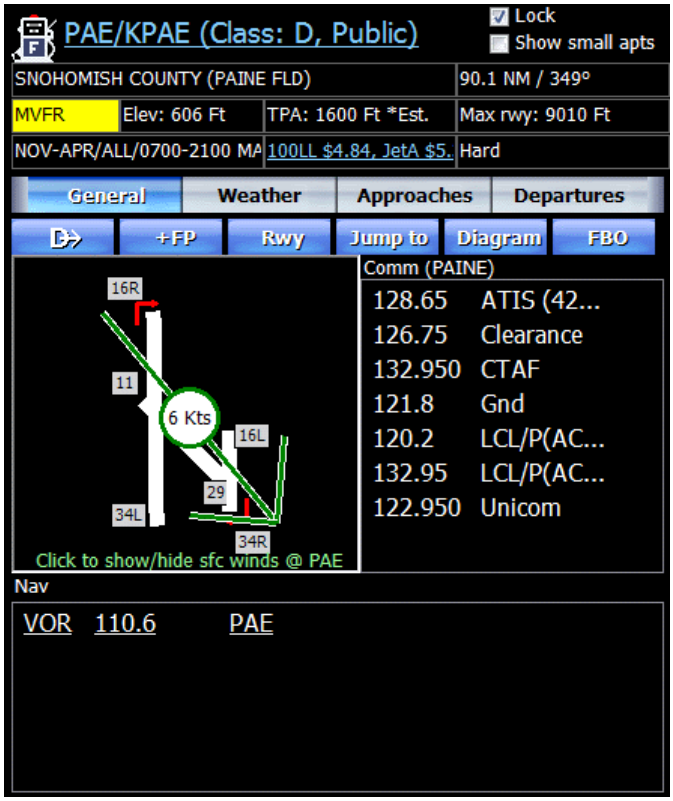
Sometimes you want to focus on a single, large map. Sometimes, you want to see an approach plate and a map at the same time. Or perhaps two maps, one with a seamless IFR chart and one with a wide-view of the upcoming weather. With the SkyPad^2, click the Layout button and, with one more click, select the screen configuration that works best for you. Advanced users can pick from several layouts.

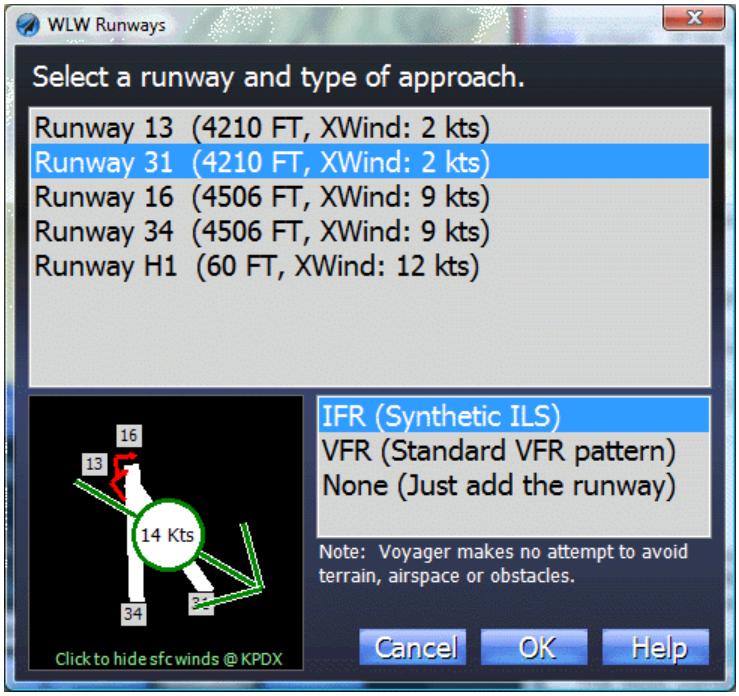
2D and 3D

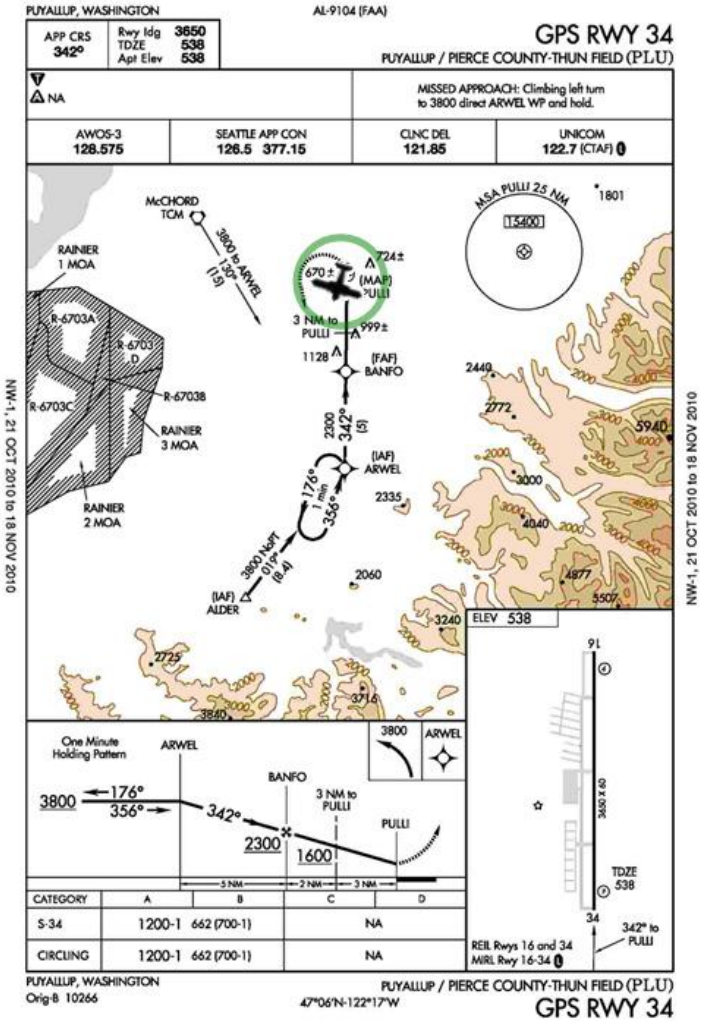
While flying is fundamentally 3D, it's ironic that aviation moving maps are generally 2D. The advanced DirectX-based charting engine we designed for the SkyPad^2 is equally at home in 2D or 3D mode. And our 3D mode is much closer to a true HITS (Highway In The Sky) than anything we've seen on the iPad. That means 3D terrain, 3D airspace, TAWS, and a "fly through the boxes" representation of your flight plan. Just click the 3D button to toggle between 2D and 3D.

Airport Info

Generally speaking, you fly to and from airports, so getting the airport information quickly can make the difference between a fun flight and a tedious one. The SkyPad^2 Airport Info widget means it only takes a click or two to get to the information you need (in fact, as you fly, Voyager automatically flips to the nearest airport without even a click). Not only does that mean quick access to weather and geo-referenced approach plates, it also means some unexpected but useful touches such as a surface-wind indicator (the green arrow) and a super-simple way to have the computer calculate the ideal runway given the winds. It even generates a perfect VFR or synthetic ILS approach and adds it to your flight plan!

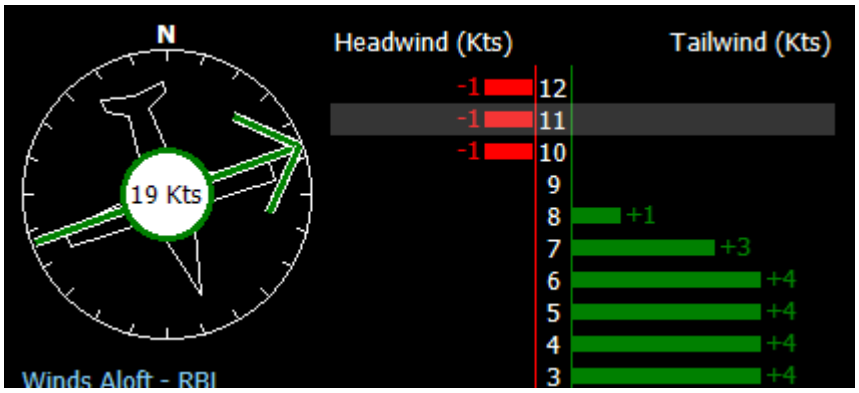



WLW Runways
Select a runway and type of approach.
Runway 13 (4210 FT, XWind: 2 kts)
Runway 31 (4210 FT, XWind: 2 kts)
Runway 16 (4506 FT, XWind: 9 kts)
Runway 34 (4506 FT, XWind: 9 kts)
Runway H1 (60 FT, XWind: 12 kts)
16
13
14 Kts
34
Click to hide sfc winds @ KPDX
IFR (Synthetic ILS)
VFR (Standard VFR pattern)
None (Just add the runway)
Note: Voyager makes no attempt to avoid terrain, airspace or obstacles.
Cancel
OK
Help


PUYALLUP, WASHINGTON
AL-9104 (FAA)
GPS RWY 34
PUYALLUP / PIERCE COUNTY-THUN FIELD (PLU)
APP CRS 342°
Rwy Idg 3650
TDZE 538
Apt Elev 538
NA
MISSED APPROACH: Climbing left turn to 3800 direct ARWEL WP and hold.
AWOS-3 128.575
SEATTLE APP CON 126.5 377.15
CLNC DEL 121.85
UNICOM 122.7 (CTAF)
McCHORD TCM
3800 to ARWEL 130° (15)
RAINIER 1 MOA
R-6703A
R-6703 D
R-6703C
R-6703B
RAINIER 3 MOA
RAINIER 2 MOA
MSA PULLI 25 NM
15400
1801
724±
670±
(MAP) PULLI
3 NM to PULLI
999±
1128
(FAF) BANFO
2300
342° (5)
(IAF) ARWEL
176°
1 min
356°
3800 NoPT
019° (8.4)
(IAF) ALDER
2060
2335
2449
2772
5940
3000
4040
4877
5507
3240
ELEV 538
2725
3716
3840
NW-1, 21 OCT 2010 to 18 NOV 2010
One Minute Holding Pattern
ARWEL
BANFO
3800
176°
356°
342°
2300
1600
3 NM to PULLI
PULLI
5 NM
2 NM
3 NM
CATEGORY A B C D
S-34 1200-1 662 (700-1) NA
CIRCLING 1200-1 662 (700-1) NA
3800
ARWEL
9L
3650 x 60
TDZE 538
34
342° to PULLI
REIL Rwys 16 and 34
MIRL Rwy 16-34
PUYALLUP, WASHINGTON
Orig-B 10266
47°06'N-122°17'W
PUYALLUP / PIERCE COUNTY-THUN FIELD (PLU)
GPS RWY 34

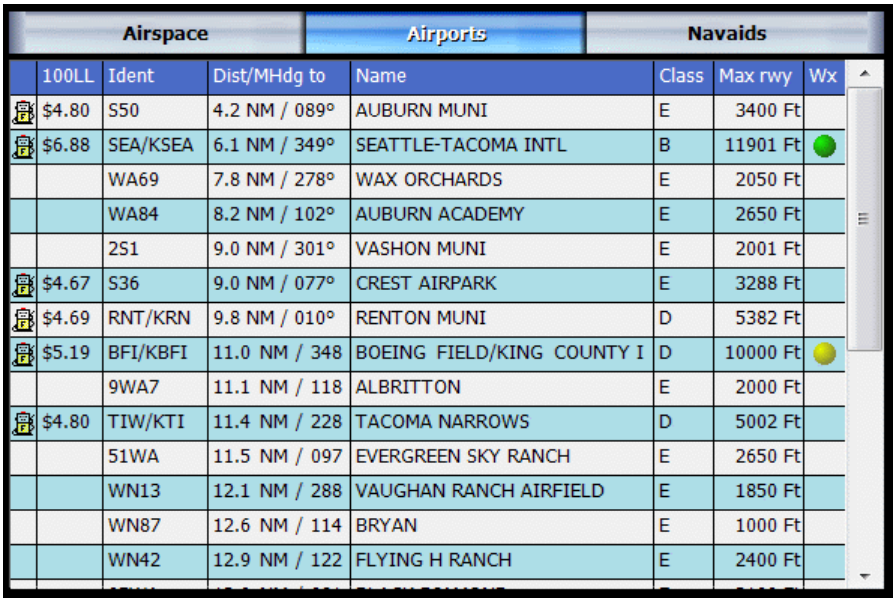
Wind Optimizer

I think this is just flat-out cool. The Wind Optimizer widget uses simple green and red indicator bars to tell you how much headwind or tailwind to expect at any altitude. In other words, mid-flight it tells you what altitude is best.



Nearest

All GPS systems have a Nearest button or Nearest page. The SkyPad[2] goes further by having a Nearest widget that is constantly updated to show you the nearest airports and navaids. More than a simple list, it also shows key information about each such as runway length, airspace class, weather conditions, and even fuel prices. Want more info about an airport? Just tap.

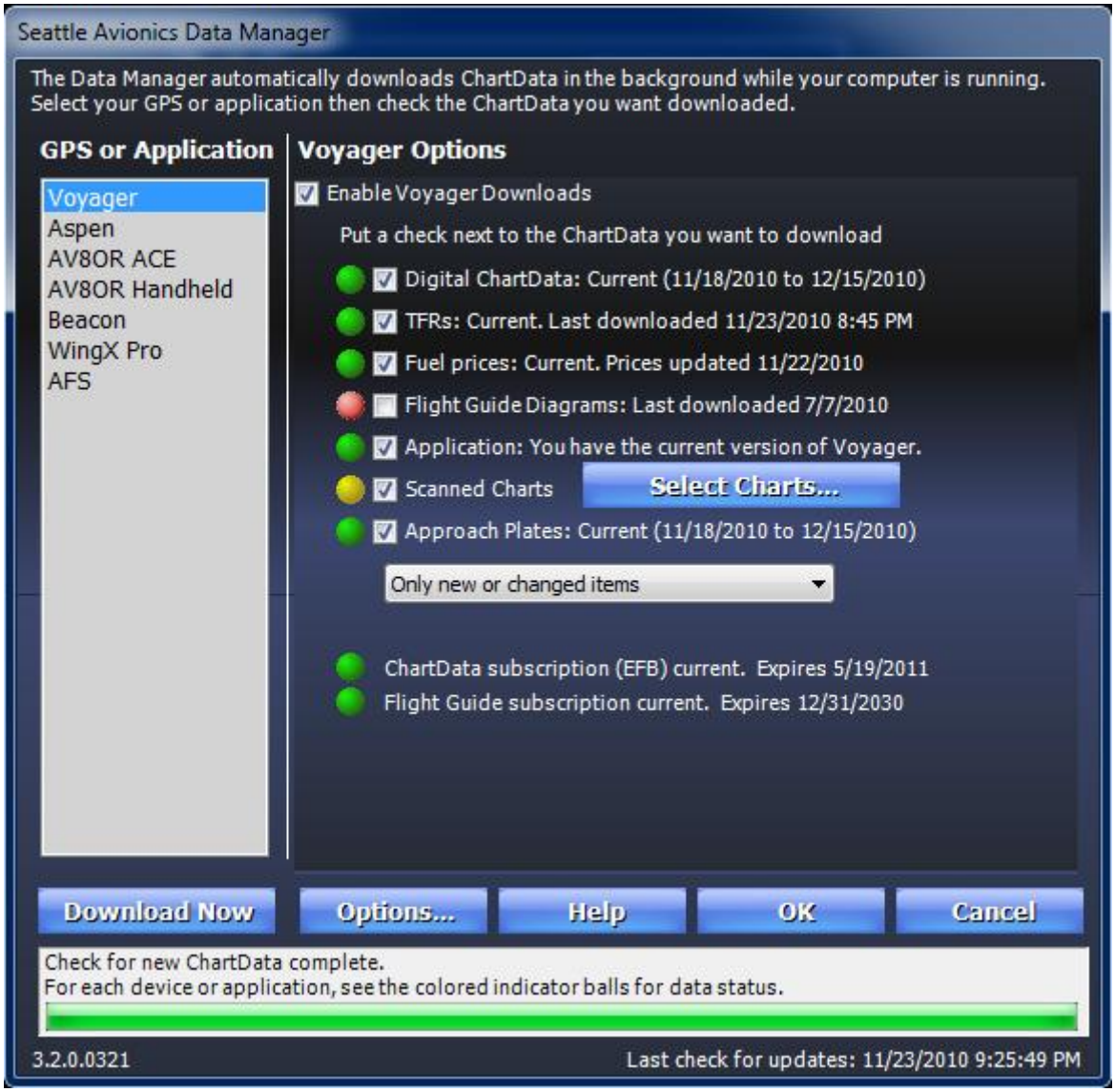


100LL	Ident	Dist/MHdg to	Name	Class	Max rwy	Wx
$4.80	S50	4.2 NM / 089°	AUBURN MUNI	E	3400 Ft	
$6.88	SEA/KSEA	6.1 NM / 349°	SEATTLE-TACOMA INTL	B	11901 Ft	
	WA69	7.8 NM / 278°	WAX ORCHARDS	E	2050 Ft	
	WA84	8.2 NM / 102°	AUBURN ACADEMY	E	2650 Ft	
	2S1	9.0 NM / 301°	VASHON MUNI	E	2001 Ft	
$4.67	S36	9.0 NM / 077°	CREST AIRPARK	E	3288 Ft	
$4.69	RNT/KRN	9.8 NM / 010°	RENTON MUNI	D	5382 Ft	
$5.19	BFI/KBFI	11.0 NM / 348	BOEING FIELD/KING COUNTY I	D	10000 Ft	
	9WA7	11.1 NM / 118	ALBRITTON	E	2000 Ft	
$4.80	TIW/KTI	11.4 NM / 228	TACOMA NARROWS	D	5002 Ft	
	51WA	11.5 NM / 097	EVERGREEN SKY RANCH	E	2650 Ft	
	WN13	12.1 NM / 288	VAUGHAN RANCH AIRFIELD	E	1850 Ft	
	WN87	12.6 NM / 114	BRYAN	E	1000 Ft	
	WN42	12.9 NM / 122	FLYING H RANCH	E	2400 Ft	

Downloading Data

Every aviation application needs to download new data at least once a month. Some items, like fuel prices and TFRs, need to be downloaded at least daily. This is a major difference between the SkyPad^2 and all iPad apps. To download data to an iPad app, you need to open the app and click buttons to select and download the data you need. Then you have to wait while it does it because most iPad apps can't download data while doing anything else.

The SkyPad^2, by contrast, uses our exclusive Data Manager applet that always runs quietly in the background of the SkyPad^2 to monitor for and download new info as it becomes available. So long as you leave your SkyPad^2 connected to the Internet, that means it downloads all the new monthly data overnight on the day it comes out. When you wake up, you'll find that the SkyPad^2 is already loaded with the new data and ready to fly. Once downloaded, it's ready for use in-flight while you have no Internet connection.



XM Weather

Aviation is far from a static experience. Weather has a nasty tendency to change during flight. Luckily, an inexpensive XM weather receiver can be added to the SkyPad^{2}to download weather while flying.

There is currently no way to attach an XM receiver to an iPad although that may change over time. SkyRadar offers real-time weather in the cockpit, but it does require a receiver that is roughly twice as expensive as an XM receiver. Moreover, while the XM service has the non-trivial downside of being a monthly expense, XM does provide full coverage across the country. One day, ADS-B will have that same coverage, but not today. And, by that time, Apple will have the iPad 4 and we'll have the SkyPad 5.

Aviation-Grade WAAS-enabled GPS

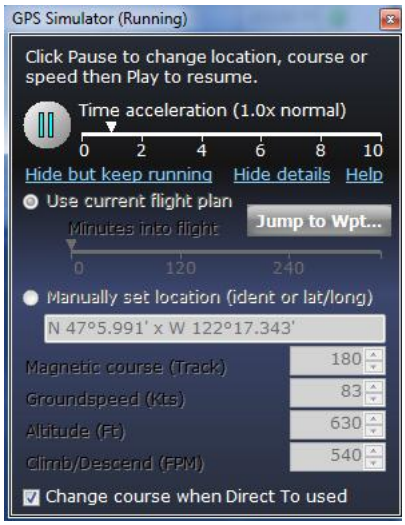
The iPad, depending on which model you buy, may have a built-in GPS. That's good because it's one less thing to carry around. But it's bad for two reasons. First, it simply isn't a good GPS. Not only does it lack WAAS so can't be very precise, it seems to rely on assistance from cell-phone triangulation and Wi-Fi lookups for optimal performance. Since these don't apply when you're at 10,000 ft., it just won't be as accurate as an aviation-grade, WAAS-enabled GPS. And, honestly, the GPS in the iPad sometimes just doesn't work at all in flight. Recently, on our way from Seattle to Long Beach for the AOPA Summit, we used both an iPad and a SkyPad^2 Slate on a Cessna 414. For whatever reason, the iPad simply could not get a GPS lock at all, let alone an accurate one, until we were about to land. We tried every aviation app we had, even a hiking GPS program, but nothing worked so I don't think it was a software issue. The SkyPad^2, by contrast, acquired and held the GPS lock the whole flight.

In addition, having a separate GPS, while a slight pain, means you can position the GPS itself for optimal reception on the windscreen (often with Velcro) while the tablet remains on your knee or in your yoke.

The GPS that we include with every SkyPad^2 is a hard-core, time-tested, WAAS-enabled Bluetooth receiver made by GlobalSat. We've been selling it for your years and it never lets us down.

GPS Simulator

We think it's best to learn how to use a GPS while sitting at home. Therefore, we put a powerful GPS simulator into the SkyPad^2. You can load a flight plan into it and "fly" the mission, testing every feature as you go. Don't have six hours for the flight in real-time? Use the "warp-factor" (time acceleration) feature to travel as much as 10 times faster than normal.



Flight Planning

Voyager consistently wins the *Aviation Consumer* award for best flight planner, most recently winning just a few months ago. Wind-optimized routing, routing that automatically optimizes to get you the lowest fuel bill, and much more. This is where Seattle Avionics began.

Conclusion

Hopefully this article gives you some insight into the relative merits of the iPad versus the SkyPad[2]. Which is best? That's up to you and depends on your needs and your desires.

There is a lot of new aviation technology this year. I hope this note has helped explain some of it.