



IPAD NAVIGATION

FLYER's Ian Seager offers a welcome and realistic beginner's guide to iPad hardware, software, cockpit mounting solutions and linked GPS and other add-on devices

> Compared to the consumer electronics market, things generally don't happen very fast in aviation, but when Apple's iPad found its way into General Aviation cockpits, things started to change. In the three years since its introduction, we've not only seen big changes and improvements in hardware, and the introduction of the iPad Mini, but perhaps more importantly the available aviation software has surpassed what was previously available on clunky desktops – and it has spread to cover almost every conceivable part of aviation. For those who jumped in and adopted early, the

biggest challenge is probably getting your credit card to keep up with the spending, but if you haven't yet taken the plunge and joined the band of iPad-toting pilots, it can all seem very confusing.

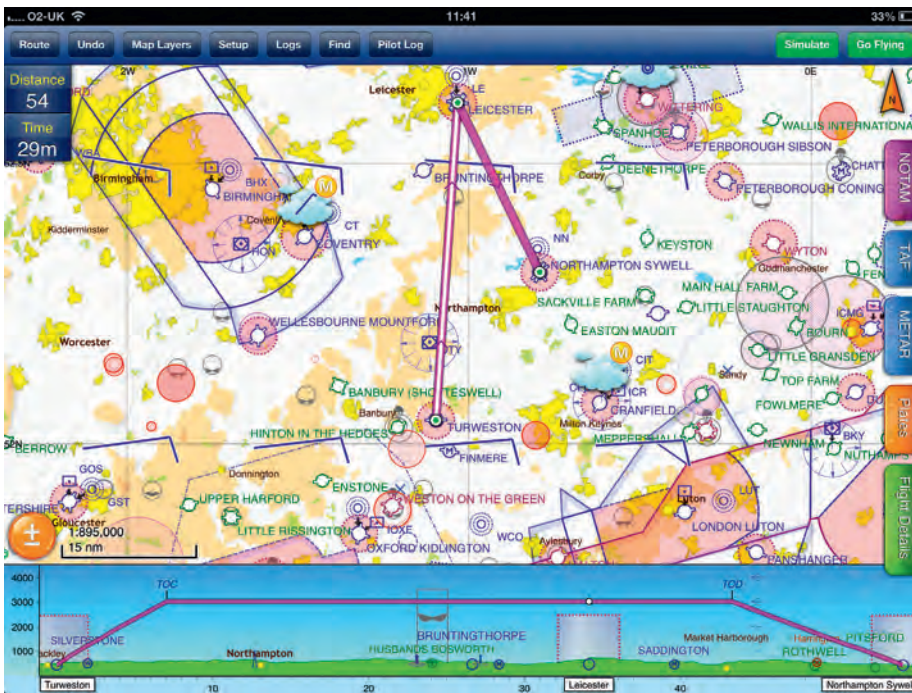
HARDWARE

The first decision that you are going to be faced with is which iPad should you get. There are currently 14 different models available, so some guidelines on choice are going to be useful.

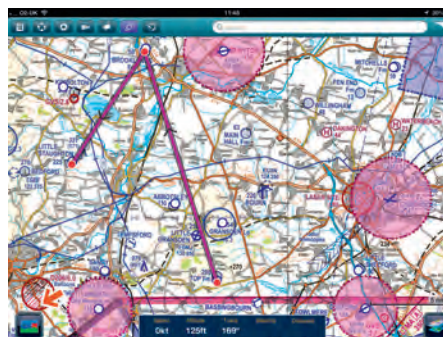
The first thing to consider is physical size. The original iPad (9.5in/241.2mm x 7.3in/185.7mm) offers a luxurious screen size, but many find that it's just that little bit too large for comfortable use and mounting in many cockpits.

If you plan to use yours for navigation rather than as an electronic reference book, you'll need to consider size and make your choice (the iPad Mini measures 7.87in/200mm x 5.3in/134.7mm).

Once you've done that, there are a couple of other things that apply to both sizes that you need to consider. You'll see that Apple offers either a Wi-Fi model, or a Wi-Fi + Cellular (often referred to as 3G/4G) model; the latter has a slot in which you can put a sim card and sign up to a data contract for a couple of pounds a day or about £10 a month but, and more importantly for us, only the cellular model has a built-in GPS, and that works even if you don't insert a sim card. It is possible to use an external GPS,



SkyDemon is the UK's most popular pre-flight planning and navigation software for the iPad. Although feature rich, SkyDemon is intuitive to use



IPAD PROBLEMS

WITHOUT DOUBT THE iPad is a superb piece of hardware that works very well in an aviation environment, but like everything in life, it's not perfect; so what do you need to look out for? Probably the biggest issue that some people are having is screen brightness. If you have a lot of plexiglass, or worse still a bubble canopy, you are going to struggle to read the screen in bright sunlight (not that we've seen much of that late). There are things you can do, like providing some kind of shade for the iPad or an anti-reflection screen protector, but the bottom line is that a lot of the bespoke aviation hardware out there is easier to read when the clouds finally clear.

The other issue that some have reported, although I've never seen it myself, is the iPad shutting down completely. Basically the iPad is continually monitoring its own temperature, and if it gets too hot it shuts itself down as a protective measure. All you'll see is a yellow triangle and the words 'iPad needs to cool down before you can use it'. You can avoid this happening by not leaving it in direct sunlight – putting it on the glare shield in direct sunlight is a no no. I've used mine extensively on a yoke mount and kept it on my knees or on the floor and never had a problem.

The last problem that some have struggled with is the availability of data when offline. Most apps give the option of storing data on your iPad, or looking it up on the Internet when you need it. More than one pilot has checked something in the clubhouse and seen something appear courtesy of the Internet, but found it missing when in the air. To make sure you have what you need before you fly, you may like to give your iPad a little pre-flight check, i.e. turn the Internet off on your iPad and make sure that you can still get to everything you'll need when flying.

Far left: There are hundreds of weather Apps, but one of our favourites is AeroWeather
Left: Runway HD makes use of digitised charts, so if you want to eschew the advantages of vector mapping you can buy and load 1:250:000 or 1:500:000 CAA (OK NATS) charts

but more of that later. The Wi-Fi + Cellular model is £100 more expensive than the non-cellular version.

So, you know what size you want and you know whether or not you want to be able to get data when on the ground and out of Wi-Fi range (useful for getting the latest weather), and use Apple's internal GPS.

The only other thing you have to consider is the amount of memory that you want. The iPad is available with 16GB, 32GB or 64GB – how much you need depends on exactly what else you are going to do with your iPad. If you are thinking of flying only, then you can probably get away with 16GB, if however you are going to use it to store pictures, videos, music, etc, then bigger is better. Prices range from £269 for a Wi-Fi only iPad Mini, with 16GB, to £659 for a full-size Wi-Fi + Cellular with 64GB. Of course, you can buy used or refurbished iPads (the same considerations apply) for less, and as long as you steer clear of the first generation iPad (which struggles a bit with performance these days) all will work well.

SOFTWARE

In many ways, deciding on the hardware is the easy bit. Pop down to your local Apple store so that you can see it in the flesh, and then buy the best that you can get for your budget. If almost all of your flying is pretty local, then there's probably no great need to be able to get

the latest data on the ground, but if you cover decent distances, or lengths of time, then easily getting the latest TAFs, actuals and Notam can be very useful indeed. However, when it comes to software there are literally thousands of apps available that cover almost anything you can think of, so it can be difficult to pick your way through the maze.

The obvious place to start is with the big navigation apps, SkyDemon, Runway HD, PocketFMS, AirNavPro, iAeronautical, etc. To varying degrees, these roll pre-flight planning and navigation into one app that provides you with graphical weather, Notam, a map of your route, a PLOG, a frequency list, airfield charts, moving map navigation and airspace warning into one. The best of them are intuitive to use and quick to learn, with some providing a free trial, so you can try before you buy.

Other software provides great reference material, take for example iVAC, a free app that lets you download all of the official VFR airfield plates for France so that you have them all there, up to date, on your iPad when you need them. There are numerous weather applications (many free or low cost) that show all sorts of things from rainfall radar to cloud cover, weight & balance applications, performance calculators, E6B emulators, unit converters, logbook software, training courses, flight simulators and pretty much anything else you can think of. It's not much of an

exaggeration when they say 'there's an app for that' and if there isn't yet, it's a fair bet that one will come along before too long. If you're new to the iPad and want to just get started, you could do a lot worse than downloading one of the free trial navigation packages (SkyDemon seems to be the market leader), a weather app like AeroWeather and any of the free unit conversion apps that are available.

MOUNTING YOUR IPAD

Getting the most from your iPad in flight has a lot to do with how and where it is mounted, and assuming that you are planning to use it as more than just an electronic flight bag (i.e. document storage and retrieval system) you'll want it either in view all of the time or at least readily accessible. Luckily the mounting accessory industry hasn't been slow in devising all sorts of kit to help, although three main areas have emerged... There's the type that allows you to stick the mount on the inside of the perspex with the help of a suction cup system. The advantage here is that it generally keeps the unit in view and in reach all of the time, the disadvantage is that it blocks some of your view outside, and if you're using the full-size version it has the potential to block quite a lot of it. The iPad's great, but I'll take the view outside any day.

The second option is to move it down slightly and mount it onto the glare shield ➤

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or elsewhere on the panel – this obviously doesn't restrict the view outside, but it can block some instruments or take away a chunk of panel space.

Thirdly, if you have yokes rather than sticks, there are various mounting solutions available here too. I've seen a few contorted mounts that use seat rails or other bits of structure and I'm sure that if anyone can find an innovative solution that suits their cockpit, it'll come from an imaginative LAA member.

If you rent your aeroplane or fly a group machine, finding a permanent solution may not be the way to go and there are various cases and kneeboards that incorporate iPad holders, although perhaps the simplest and lightest is something called MyClip that helps attach the iPad to your leg without making you wonder if you've bought bondage gear by mistake!

THIRD PARTY HARDWARE

While the iPad is very good, there are other bits of equipment that make it much better and increase its utility significantly. The first thing on the list, particularly for those who have the Wi-Fi only version, is an external GPS. These are separate GPS aerials that communicate with your iPad via Bluetooth; beware, this is Apple and most Bluetooth GPS units will not work with your iPad. The three units that I know to work well are the GNS1000 (about £70), the Dual

XGPS150 (about £90) and the Garmin GLO (about £99); for simplicity and ease of use I'd personally plump for the Garmin GLO. I can't say that I have ever had a problem using the iPad's internal GPS chip, but I understand that some people have had issues in cockpits where the iPad doesn't have a half-decent view of the sky. An external unit provides a belt and braces approach, but it's also something else that you have to keep track of and keep charged (all of these units are charged with USB leads).

There's also a company called Level Aviation that manufactures a small lightweight AHRS unit (Attitude Heading and Reference System); a small box is installed in the aeroplane and wirelessly links to your iPad giving you, at its most basic, an onscreen Attitude Indicator. A more advanced (and of course more expensive) solution is connected to the pitot static system and provides airspeed, altitude VSI information and even engine parameters with the optional 'engine pod'.

There are countless other (less costly) accessories, including extra booster batteries (the iPad's battery is exceptionally good and a full charge will outlast the fuel endurance in 99% of the UK's GA fleet), gloves that have been specially adapted so that your touchscreen still works when you're wearing them, countless screen protectors that, err, protect your screen or reduce glare (there's even one that claims to bring NVG – Night Vision Goggles –

compatibility) and tracking devices like Spot Connect that enable you to send position reports to those on the ground or InReach, which turns your iPhone or iPad into a two-way satellite messenger (at a cost!).

SUMMARY

Even though aviation was (and probably still is) the last thing on Apple's mind, there's no doubt that the tablet is having a profound effect on the market. Garmin and its competitors have seen sales for specialist aviation GPS units drop and almost all of the big players have now released or announced their own iPad apps. Software continues to develop quickly, often with new features being released every month or so – and packages that offer moving maps, pre-flight planning, flight plan filing, weather, graphical Notam and airfield plates all rolled into one are slugging it out for market dominance, and it's the users that are benefiting from the heat of competition; the same thing is starting to happen with third party hardware.

To be blunt, we've never had access to so many features for what is a relatively low price, and what's more, when the aeroplane's safely put away for the night, we're left with something that we can use to check emails, watch movies, listen to music, read books and hundreds of other things too. What's not to like? ■

OTHER PLATFORMS

INCREASINGLY THE TABLET world seems divided between Apple and Android solutions. For now, Apple's platform has the upper hand largely because some of the big software providers only offer Apple solutions, but also because it provides a reliable, consistent hardware platform. That may well change, and in the future we may see the major apps also available on Android, so if you're not a fan of the Apple platform a bit of patience may well be rewarded, eventually.



When it comes to powering the iPad in the cockpit you'll need to deliver 2.1A, so if you are going to use a standard accessory plug, make sure you have an adaptor that delivers enough power



The iPad Mini will obscure less of the cockpit than the standard iPad design



The iPad allows the display to be shown in landscape or portrait mode



Using the iPad in the cockpit significantly reduces the amount of paper that needs to be carried (although ideally this chap has paper charts and airfield plates as backup)