

SPORTY'S iPad PILOT NEWS

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WHICH IPAD IS BEST FOR PILOTS?

page
3

PAGE 16

Maximizing your
iPad battery life



How to plan a trip
in ForeFlight

PAGE 4

How to choose the right
ADS-B receiver

PAGE 6

How to get audio alerts
from your favorite app

PAGE 44

IN THIS EDITION

A STEP-BY-STEP
APPROACH TO PLANNING
A TRIP IN FORELIGHT

4

USING STRATUS TO RECORD
AND PLAY BACK FLIGHTS

10

HOW TO MAXIMIZE iPad
BATTERY LIFE

16

iPAD SCREEN PROTECTORS:
WHICH ONE IS BEST?

27

HOW TO USE YOUR iPad WITH
FLIGHT SIMULATORS

41



UNDERSTANDING
ADS-B TRAFFIC

PAGE 13



WHAT ABOUT
ANDROID?

PAGE 39



TOP
15

AVIATION
APPS

page
24

Prices and Specifications subject to change without notice



BRET KOEBBE

ATP, Flight Instructor

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WHAT'S THE BEST IPAD FOR PILOTS

The original Apple iPad was released nine years ago, on April 3, 2010. Since then, Apple has continuously improved the tablet, making upgrades to its storage capacity, screen resolution, processor, connectivity options and form factor. The iPad Pro 11" and 12.9" are the most powerful models currently available for sale, and represent an enormous leap in performance over the original iPad, like going from a Cub to a Learjet.

While these high-performance Pro models would suit (and honestly exceed) most pilots' needs in the cockpit, there are some other options and features worth considering when purchasing an iPad for use in aviation. Here we'll break down the differences in each, and give some insight for those looking to buy a used or refurbished iPad, which is a great way to save some money.

iPad Pro, iPad or iPad Mini?

Apple currently offers 5 models of iPad: the iPad Mini 5, the iPad, the iPad Air 10.5", the iPad Pro 11" and the iPad Pro

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12.9". The iPad, iPad Air 10.5" and the iPad Pro 11" feature nearly the same external dimensions and pilots will find that all three work very well with nearly every aviation app available. The 10.5" and 11" specs on the iPad models refer to the screen's diagonal dimension, meaning these models feature more screen real estate than the standard iPad while maintaining a similar form factor.

The iPad Pro 11" improves on the iPad Pro 10.5" design by including a large edge-to-edge display, high-performance processor, and FaceID to quickly unlock the device. It also includes a bright, high-resolution liquid retina display with an anti-reflective coating. The latest iPad Pro 12.9" model represents a major improvement over the original iPad Pro 12.9" and is 25% smaller while retaining the same display size, thanks to the edge-to-edge screen. The footprint is about the same as a sheet of paper, so it's a good fit now in most GA cockpits. It comes at a premium price, but we can recommend this model now for those that want the most screen real estate possible.

The budget-friendly model referred to now as just "iPad" is no slouch and features Apple's powerful A10 Fusion Processor. This is a great buy for less than half the price of the Pro model, but there's no doubt the iPad Pro is the most powerful iPad available today.

If you're looking for an iPad with a smaller footprint, consider the iPad mini. This version measures 7.87" by 5.3" and will be a better fit in cockpits with tighter constraints. It runs at the exact same resolution as the full-size iPad model, so all the iPad apps currently available are compatible with it. It finally received an update in March this year, so it's a great option. You won't see quite the same performance as the iPad Pro models, but it's a good value.

If you're using an iPad 3, 4 or original Air, it may be time to consider an upgrade. While most apps will still run on these models, the processor is noticeably slower. Plus, the latest version of Apple's iOS platform won't run on the iPad 1 – 3, so you'll be stuck on an older version.

WiFi-only or WiFi + Cellular model?

After choosing a size, it's on to the connectivity question. This is pretty simple, but there are some confusing terms thrown around, so let's start basic.

Every iPad model ever built offers WiFi connectivity to the internet, so you can connect to your home network, your office



network, a local coffee shop, etc. But you can also buy an upgraded cellular model – called LTE – that receives wireless data from AT&T or Verizon (for a monthly fee). The benefit to pilots with the cellular model is that it also contains an internal GPS receiver, which is useful for showing your aircraft's position on aviation maps (although it has some minor limitations). The cellular model also allows you to download weather and file flight plans on the go, but don't count on this cellular data connection to work in the air. In our experience, it just isn't reliable. It's also technically illegal.

The internal GPS on an iPad with cellular data is completely independent of the cellular antenna and does not require that you activate a data plan from AT&T or Verizon to work properly. You could buy a cellular model iPad and use the GPS without ever activating your service.

So which is the right choice for pilots? Either one, really. The GPS that comes with the LTE model is nice, but for the price of this upgrade, you could buy an external iPad GPS that is more reliable in some ways. We'd advise you choose the cellular model iPad only if you think you'll use that mobile data connection a lot.

Storage Capacity

Apple offers multiple versions of internal storage options for iPads: the entry-level iPad is available in two sizes, either 32GB or 128GB, while the newer models feature 64GB, 256GB, 512GB, and 1 TB storage options. Downloading all the VFR & IFR charts for the entire United States across multiple data cycles can take nearly 20GB, so even the smallest option available can work but it's tight. And then you have to consider that you might also want to store high-resolution terrain data, synthetic vision, charts for Canada, Mexico and the Caribbean, and PDF documents.

Another thing to keep in mind is that many apps like ForeFlight allow you to download the next cycle's charts approximately four days in advance. If you plan to keep charts for the entire U.S. on your iPad, you'll need additional free space during this transition period each month.

Finally, consider that you may use the iPad for more than just aviation (e.g., pictures, videos, other apps), so you'll want to leave open some free space for those items. The iPad's storage is not upgradeable, so you have to commit to a size up front. For all these reasons we recommend you go with the mid-range 256GB for the iPad Pro models, or the 128GB 9.7" iPad, both of which are a \$100 upgrade over the base model. The 32GB model can work, especially if the iPad is mostly used for aviation, but we've found that a minimum of 128GB is a lot more comfortable for most pilots. 512GB is overkill for all but the most dedicated gamers or video producers.

Conclusion

The good news is that any iPad model will work for pilots, so there's not a bad choice here. But some are definitely better than others. So which model do we recommend? Based on our experiences flying with each model of iPad, we think the 11" iPad Pro, WiFi-only, 256GB is the ideal choice if you're looking to buy a new iPad that will last for years. For those on a budget, the iPad mini 5 (WiFi-only, 256GB) is a great alternative, available for nearly half the price of the Pro model.

We've found the reliability and performance of external GPS receivers to be superior to the internal option, and they're available for under \$100 – less than the upgrade to the cellular model. For the ultimate setup, we recommend adding a wireless ADS-B receiver, like Stratus, which provides subscription-free in-flight weather and WAAS GPS position data.

A high-speed train, possibly a Shinkansen, is shown in motion, blurred background, with a large title overlay. The train is white with blue and red accents, and is moving towards the right. The background is a blurred green field and a grey track. The title is in large, bold, white capital letters, with the first part in a smaller font size. The text is positioned on the left side of the image, with a horizontal line separating the title from the subtitle. The subtitle is in a smaller, white font size and is positioned below the title. The overall image has a dynamic, high-speed feel.

A step-by-step approach to **PLANNING A TRIP IN FOREFLIGHT**

While in-flight features like terrain alerts and ADS-B weather get a lot of attention, it's the preflight where apps like ForeFlight can really save time. They make it easy to evaluate airports, find the best route, calculate weight and balance, review weather, and so much more. But with all these features comes a certain amount of complexity.

How do you plan a flight – from the Maps page, the Flights page or somewhere else? In this article, we'll walk through a procedure for planning a flight and considering all the important information. It's certainly not the only way to plan a flight in ForeFlight, but it should get you thinking.

How do you plan a flight – from the Maps page, the Flights page or somewhere else? In this article, we'll walk through a procedure for planning a flight and considering all the important information. It's certainly not the only way to plan a flight in ForeFlight, but it should get you thinking.



Now you have a good idea of what your flight will look like. The next step is to use the Flights page to finalize details, but there's an easy way to save time and eliminate the need to re-enter data. From the Edit box, tap the up arrow at the bottom right corner. Using the Send To menu, you can send your route, altitude and airplane to the Flights tab.

[illegible]

At the top of the Flights page, tap the Briefing button to request an official preflight weather briefing. This will include all the essential information you need to make a smart go/no-go decision, including the synopsis, AIRMETs/ SIGMETs, METARs, NOTAMs, and more.

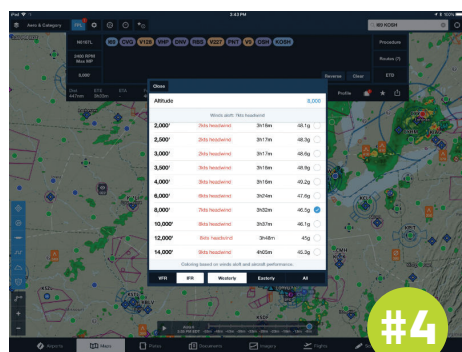


ForeFlight makes it easy to download all your chart databases for a specific flight, with its Pack feature. This can be done on the Maps page, but there's also a button for it at the bottom of the Flights page that is very convenient. Tap the Pack option and download everything for the flight.



JOHN ZIMMERMAN

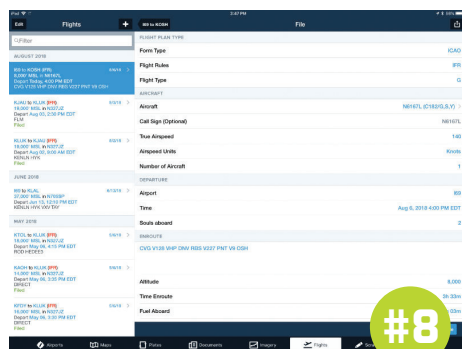
ATP
VICE PRESIDENT
Sporty's Pilot Shop



#4

Choose an altitude

The last step on the Maps page is to pick the right altitude. For this, tap on the altitude button on the left side of the Edit box. Your aircraft's default altitude will automatically be selected, but you can choose another to minimize time or fuel burn. Note that an internet connection is required to get updated winds aloft data.



#8

File your flight plan

At the bottom of the page, tap the Proceed to File button to file your flight plan with ATC. You'll receive an acknowledgement almost immediately and later on you'll receive an expected route from ATC.

THE STEPS

#1

Enter departure and destination on the Maps page

#2

Choose your airplane

#3

Choose a route

#4

Choose an altitude

#5

Send to Flights

#6

Request a formal briefing

#7

Pack your databases

#8

File your flight plan



ForeFlight

ForeFlight is the critically acclaimed flight planning, flight support, and electronic flight bag (EFB) app for pilots. Navigation charts, internet and in-flight weather, moving map, hazard and terrain awareness, wireless connectivity, data syncing and backup, and much more. Built with an attention to detail and backed by a dedicated, fanatical support team, ForeFlight is a best selling aviation app for iPad, iPhone, and iPod touch.

ForeFlight Basic Plus	99031A	\$99.99/year
ForeFlight Pro Plus	99030A	\$199.99/year
ForeFlight Performance Plus	99032A	\$299.99/year



Flying with ForeFlight Course

ForeFlight Mobile has become the most popular app for pilots, with powerful features and an easy-to-use interface. But like any software, there's a lot to learn and some time spent learning the basics can really pay off. That's why Sporty's developed this comprehensive ForeFlight training video, packed with jargon-free tips and real world shortcuts. It's ideal for prospective users, new ForeFlight pilots and experienced pros alike. Approx. 106 minutes. Includes online and app.

- Go in depth with the route editor to learn how to choose the right route
- Learn the preflight iPad checklist you should use every time
- Explore how to use the Logbook, Weight and Balance and Track Logs
- Get tips for using wireless iPad accessories with ForeFlight
- Fly along on a real trip to see everything in action

E7402A \$29.99

WHICH ADS-B RECEIVER SHOULD I BUY?



DOUG RANLY

Private Pilot
CATALOG MANAGER
Sporty's Pilot Shop

ADS-B receivers continue to be the most popular iPad accessory on the market. These all-in-one devices stream GPS, subscription-free weather, traffic and optional backup attitude information to your iPad, changing it from a static chart viewer to an interactive in-flight tool. Some even include SiriusXM weather and entertainment features. How do you pick the right one? Here are some questions to consider.

Choose an app first

The first tip is easy: choose the app you prefer first, then choose an ADS-B receiver that works with that app. Some pilots get this backwards, chasing hardware around and switching between apps. That just leads to confusion and frustration.

As a pilot, you have to live with your aviation app on every flight (and in between them) whether you use an ADS-B receiver or not. Make sure your app is one you understand and feel comfortable using. Whether it's ForeFlight, Garmin Pilot, WingX, FlyQ or something else doesn't matter - the right app is the one that works for you and your flying. Try them all (they offer free trials so you can couch fly them) and become truly proficient with the one you select. After picking your app, then it's easier to choose the right ADS-B option. Because of the deep integration required between app and accessory, some ADS-B receivers are app-specific:

- *ForeFlight*: Stratus 3, Sentry, Scout, Garmin GDL 50/51/52
- *Garmin*: GDL 50/51/52
- *FltPlan Go*: Stratus 3, GDL 50/51/52, Dual XGPS 170D, Dual XGPS 190
- *WingX, FlyQ, Aerovie*: Stratus 3, Dual XGPS 170D, Dual XGPS 190

Don't misunderstand us: there are differences between the various ADS-B receivers. But these differences pale in comparison to the apps. You have to start here.

Using a Garmin portable GPS?

If you fly with a Garmin 796 or aera 660, there is an additional consideration. The GDL 50/51/52 can feed information to a portable GPS, in addition to your iPad. This is a nice way to get extra utility out of an older GPS or to have a full-featured backup navigator in the cockpit.

For the 796 and aera 660, this connection is wireless via Bluetooth. For other models like the 696, it requires an adapter cable. Also note the Garmin 796/795 and aera 660 allow you to display full pitch and roll information from the GDL's built-in Attitude Heading Reference System (AHRS). This makes these truly no-compromise display units.

If you don't have one of these devices, this feature won't matter. If you have a Garmin GPS but you use another app, is it worth switching to take advantage of this? Only you can answer that question, but ask yourself which device would be primary: iPad or Garmin?



Comparing specs

Once you've settled on an app and considered the Garmin option, it's time to choose a specific ADS-B receiver. This is where it makes sense to compare specs, but it's worth noting that every receiver on the market offers the two key features: GPS and subscription-free weather. These are the things you'll use most often, and almost every unit includes them. That means there isn't really a bad option.

Beyond these basics, there are three other features to consider: battery, backup attitude sensor, and SiriusXM. Almost all receivers have a battery, but how long the internal battery lasts is an important



With an 8-hour battery and WiFi, Stratus 3 is totally wireless









feature to think about. For a homebuilder wiring in an ADS-B receiver, or for a pilot who plans to keep his receiver plugged into the cigarette lighter, a built-in battery may not be necessary. For a renter or a pilot who prefers fewer wires, a built-in battery is an essential feature. We also think it has great value as a backup.

- *No battery*: Scout
- *With battery*: Stratus 3 (8 hours), Sentry (12 hours), GDL 50 (8 hours), GDL 51 (7 hours), GDL 52 (5 hours), Dual XGPS 170/190 (5 hours)

Another feature to consider is built-in

ADS-B

BUYER'S GUIDE

RECEIVER								
ADS-B WEATHER	✓	✓	✓	✓	✓	✓		✓
SIRIUSXM WEATHER							✓	✓
WAAS GPS		✓	✓	✓	✓	✓	✓	✓
TRAFFIC	Dual-band	Dual-band	Dual-band	Dual-band	Dual-band	Dual-band		Dual-band
AHRS (ATTITUDE)		✓	✓		✓	✓	✓	✓
FLIGHT DATA RECORDER			✓					✓
CO DETECTOR		✓						
ANTENNA	Internal	Internal	Internal	Attached	Attached	Attached	Internal	Attached
BUILT-IN BATTERY		✓	✓	✓	✓	✓	✓	✓
BATTERY LIFE	N/A	12 hours	8 hours	5 hours	5 hours	8 hours	7 hours	5 hours
COMPATIBLE APPS	ForeFlight	ForeFlight	ForeFlight, WingX, Fltplan Go	WingX, Fltplan Go, FlyQ	WingX, Fltplan Go, FlyQ	Garmin Pilot, GPSS, ForeFlight, Fltplan Go	Garmin Pilot, GPSS, ForeFlight, Fltplan Go	Garmin Pilot, GPSS, ForeFlight, Fltplan Go
CONNECTION	WiFi	WiFi	WiFi	Bluetooth	Bluetooth	Bluetooth	Bluetooth	Bluetooth
PRODUCT #	6599A	6891A	6647A	7293A	9265A	7261A	7147A	6241A
PRICE	\$199.00	\$499.00	\$699.00	\$499.99	\$749.99	\$699.00	\$649.00 +\$200 REBATE	\$1,149.00 +\$200 REBATE

AHRS to deliver backup attitude information or synthetic vision to your iPad. This is not a primary instrument, but in a worst case scenario, we would not hesitate to use it. For a VFR pilot, it may be overkill and you can save money by choosing a non-AHRS model, but we still think there's value in it for situational awareness. For an IFR pilot, it's a great insurance policy.

• **No AHRS:** Scout, Dual XGPS 170D

• **With AHRS:** Stratus 3, Sentry, GDL 50/51/52, Dual XGPS 190

For pilots who fly in Canada, or for those flying high performance airplanes, SiriusXM weather is another nice option to consider. This weather is delivered via satellite, so unlike ADS-B there are no coverage limitations - it works from coast-to-coast, even on the ground. You'll also have access to more weather products, including base reflectivity radar, storm cells, and much more. There is a monthly subscription with SiriusXM (starting at about \$30), but you can also add music to your subscription.

- **ADS-B Only:** Scout, Sentry, Stratus 3, GDL 50, Dual XGPS 170D, Dual XGPS 190
- **SiriusXM Only:** GDL 51
- **SiriusXM and ADS-B:** GDL 52

“Whether it’s ForeFlight, Garmin Pilot, WingX, FlyQ or something else doesn’t matter—the right app is the one that works for you and your flying.”

Other considerations

There are also some additional features beyond the basic weather/GPS/traffic/attitude set. Some models, like the Stratus 3, include automatic flight data recorders so you can store your flights and replay them in apps like CloudAhoy or Google Earth. This is great for training or proficiency flights, and it's always recording.

Finally, while most pilots spend a lot of time debating ADS-B vs. SiriusXM or AHRS vs. no AHRS, we think too little time is spent on “softer” features. These include ease of use, reliability and customer support. Such features aren't easily compared in a chart,

but they impact your flying in a significant way. Consider how well-integrated the receiver is with the app you use, how easy to use the entire system is and what customers are saying about support. You can learn a lot reading customer reviews online.

One feature that doesn't matter much is reception. Every ADS-B receiver we've flown with has perfectly good reception.

Build it yourself

There is another option for pilots who enjoy a little bit of electronics work. Stratux is an open-source software project that turns commercially available parts into full-featured ADS-B receivers. For about \$150 in parts and a few hours of assembly, you can have a dual band receiver. There are even some kits available, although not all include a battery so read the parts list carefully.

Final thoughts

Don't make this decision harder than it needs to be. In its most basic form, we suggest a two step process. First choose your app, then choose whether you want “VFR features” or “IFR features.” The big difference between VFR and IFR would include a built-in AHRS and maybe SiriusXM. In most cases, you will have a decision after answering those questions. ➤

FOREFLIGHT SENTRY COMBINES ADS-B RECEIVER AND CO DETECTOR



JC MAYERLE

Recreational Pilot
EMAIL MARKETING MANAGER
Sporty's Pilot Shop

One year after releasing Scout, a tiny ADS-B receiver manufactured by uAvionix, ForeFlight unveiled the follow-on product at EAA AirVenture in 2018. Sentry is larger than Scout but also packs in a lot more features, including GPS, AHRS, and even carbon monoxide monitoring. At \$499, it's a compelling package.

Weather and traffic

It seems like table stakes these days, but the subscription-free weather and traffic available with Sentry is still the most important feature. Just like a Stratus or GDL 50, there's nothing more to do than mount it and turn it on. Sentry connects to your iPad via WiFi, and accommodates up to five devices. Simply open ForeFlight and you'll start receiving the full list of ADS-B products.

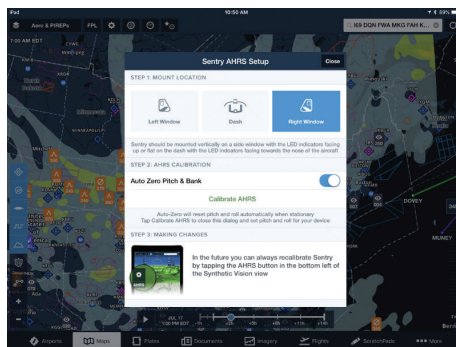
Reception seemed good in our test flights – we had weather at about 500 ft. AGL around Sporty's, and updates came in reliably. With the full ADS-B network built out now, details about reception are less important than they once were. In fact, ForeFlight no longer reports the number of towers you're receiving, only the overall quality.

We also tried the new Glance feature in ForeFlight synthetic vision to locate nearby traffic. It's pretty slick.

GPS and AHRS

Two important features Sentry has that were missing from Scout are GPS and AHRS. The addition of these two – plus a built-in 12-hour battery – makes Sentry a complete iPad accessory, driving moving map screens, terrain alerts, and a full synthetic vision display. ForeFlight shows a handy setup screen the first time you connect, which ensures you get it mounted properly.

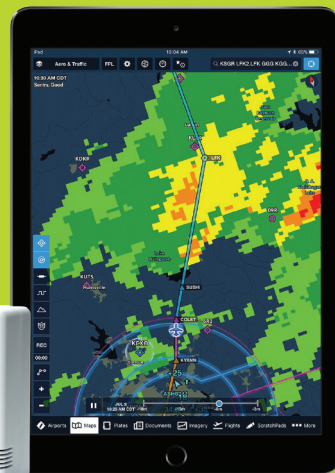
Tapping the SETUP SENTRY button brings up a second page, which offers three choices for mounting location: left window, dash, or right window. Then there's a button to zero pitch and roll on the attitude display.



Carbon Monoxide

Sentry is the first ADS-B receiver to include a carbon monoxide detector. This will be most helpful for piston airplane pilots in the winter, since many cabin heating systems are susceptible to exhaust leaks and potentially serious CO poisoning problems. The middle light on Sentry is for CO – it's green when normal, yellow when CO is above 35ppm and red when CO is above 50ppm. There's also an audio alarm and a pop-up alert in the app.

We tested this using a car exhaust system and it works. The alarm is loud enough that you would probably hear it in the cockpit, and the app alert is also quite noticeable. We didn't see the CO value change in ForeFlight until it alarmed (it stayed at 0 in our testing until going straight to 1000), but after a few minutes the light on Sentry did turn red and warn us. That's what counts, and we think this is a nice addition.



Sentry is a compact, affordable ADS-B receiver specifically made for ForeFlight. In addition to popular features like ADS-B weather and traffic, Sentry also includes a carbon monoxide detector to warn of dangerous conditions in the cockpit. No larger than a deck of cards, Sentry packs long list of features into a small size, but still offers 12 hours of battery life.

Features:

- Subscription-free weather in flight
- Dual band ADS-B traffic
- Built-in GPS
- Backup attitude information (AHRS)
- Carbon monoxide alarm
- Pressure altitude sensor
- Weather replay
- 12-hour battery
- Connect to ForeFlight

Carbon Monoxide Detector A first for portable ADS-B receivers, Sentry provides a built-in carbon monoxide sensor and alerting system, with an audio and in-app alert when CO concentration reaches hazardous levels. The LED indicator also provides a visual indication of CO levels.

Fast & Reliable Mounting Sentry's quick release mechanism means you can attach and remove it in under a second. The popular RAM® suction cup mount ensures a long-lasting seal and high heat tolerance so you can leave it in the plane between flights.

Sentry ADS-B Receiver 6891A \$499.00

Details

Sentry is designed to work with ForeFlight, so complete status information is available in the app, including battery life, GPS status, and settings. Firmware updates are also easy to do directly in the app. Sentry includes a charging cable (no wall plug), carrying case, and a suction cup mount. The mount has a quick-release mechanism so you can connect Sentry to the mount in about a second. There are no options for external antennas, so you'll need to mount it on a side window.

APPAREO INTRODUCES STRATUS 3 WITH MORE APP SUPPORT, LOWER PRICE



CHRIS CLARKE

Commercial Pilot
VIDEO PRODUCER
Sporty's Academy

The Stratus line of ADS-B receivers has been one of the most popular iPad accessories for pilots since the first one was introduced in 2012. We've seen them flying in everything from antique taildraggers to V-22 Ospreys, as the mix of subscription-free weather, traffic, GPS, and backup attitude on ForeFlight found a lot of fans. Now there's a new top-of-the-line Stratus, with some interesting new features, more app options, and a low price.

That price is the first thing that most pilots will notice. At \$699, Stratus 3 is \$200 less than the Stratus 2S model it replaces, but without any reduction in features. It still features FIS-B weather, dual band ADS-B traffic, WAAS GPS, built-in AHRS, pressure altitude sensor, and flight data recording. The battery life is 8 hours, and in our testing the ADS-B reception was still excellent.

Smart Features

One mistake we've made more than once is leaving Stratus on after a flight. In the busy time after shutting down the engine, it's easy to forget to push the power button, but that leads to a dead Stratus battery. Stratus 3 will now turn itself off after it senses your flight is over, preventing this mistake. It's smart enough to stay on during touch and goes or a long taxi, so we haven't had any issues with it turning off when we didn't want it to.

Another new feature is called Smart WiFi,

which gives pilots with LTE-enabled iPads some extra flexibility. Usually when the iPad senses a WiFi connection it will disable the LTE radio, since it assumes there is a WiFi internet connection. That's not true with Stratus – the WiFi connection is only a short range data connection, not an internet connection – so the disabled LTE radio isn't always desirable. With Stratus 3, pilots can connect to Stratus on the ground but still use their LTE connection to send an email or check a weather website.

Other updates include an improved WiFi security setting that allows pilots to hide the WiFi network or add a password. Stratus 3 also works with ForeFlight's new synthetic vision traffic feature.

GDL 90 Support

The other big change with Stratus 3 is support for additional apps. Stratus has always worked with ForeFlight at a very deep level (Appareo and ForeFlight developed the product together), and that's still true. There's also a handy Stratus Replay feature that allows you to turn off your iPad screen, then receive all the weather data you missed when you turn it back on.

Now there's another option. Stratus 3 also supports the GDL 90 protocol, an industry standard format for sharing weather, traffic, GPS, and attitude with EFB apps. That means the new model will work with a wide variety of apps, including Fltplan Go, WingX, FlyQ,

iFly GPS, and others. Some higher end features like flight data recording and Stratus Replay are not available over GDL 90, but the key features like weather and traffic are.

To use Stratus 3 in GDL 90 mode, first download the Stratus Horizon Pro app from Appareo. Turn on Stratus, connect it to your iPad, and open the app. From the settings menu, select Open ADS-B Mode.

Details

Appareo retained the same case shape and dimensions, so Stratus 2S mounts will still work with Stratus 3. Likewise, the power, GPS, and ADS-B ports are identical, so any



Make your next flight safer and easier with aviation's most trusted ADS-B receiver



"Insanely good piece of equipment."

- Simon W., Stratus owner

Stratus 3, the latest generation of aviation's top weather receiver, is your everyday cockpit companion. Just turn it on and go flying - in minutes you'll see subscription-free weather, ADS-B traffic, backup attitude, and GPS position right on your tablet. All this information at your fingertips will dramatically improve your situational awareness and help you make better in-flight decisions. Proven by millions of flight hours in everything from Piper Cubs to military fighters, Stratus is the portable avionics solution you can trust. And now it's smarter than ever.

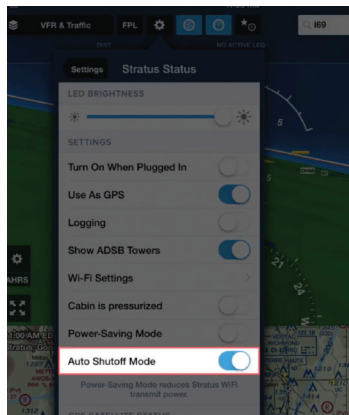
Features:

- Subscription-free in-flight weather
- Dual band ADS-B traffic
- Internal WAAS GPS
- AHRS for backup attitude
- Automatic flight data recorder
- Pressure altitude sensor
- Long-lasting 8-hour battery
- External antenna ports
- Overheat protection built-in
- Totally wireless operation

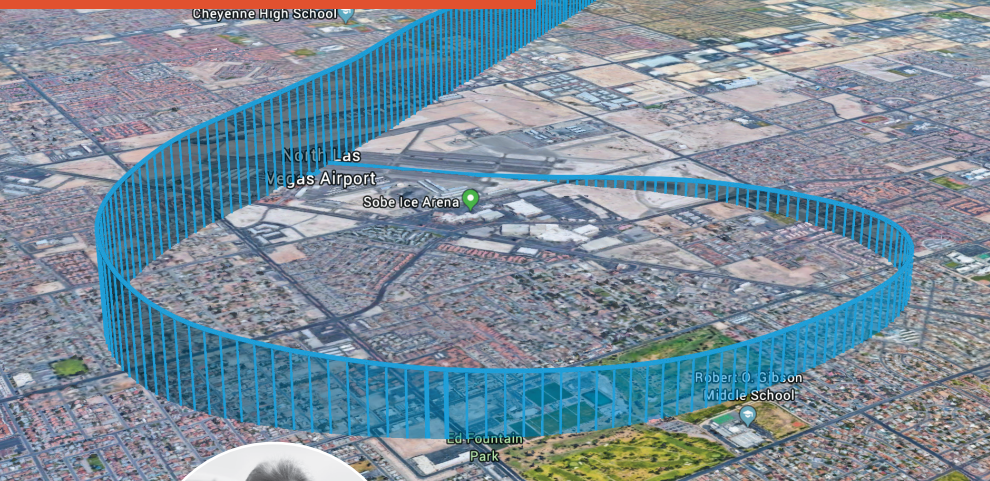
Stratus 3 ADS-B Receiver 6647A \$699.00

existing wiring can be maintained for current Stratus 2S owners.

Stratus 3 includes the dash mount, charging cable, and wall plug. The change to the dash mount from a suction cup mount is welcome in our opinion. The suction cup mount kept the unit out of sight, but it had a tendency to fail after heavy use. Stratus 3 also has a longer, 2-year warranty, the best in the industry.



USING STRATUS TO RECORD AND PLAY BACK FLIGHTS



PAUL JURGENS

ATP, Flight Instructor
VICE PRESIDENT
Sporty's Academy

The Stratus line of ADS-B receivers are well-known as weather receivers, providing subscription-free radar, METARs, and PIREPs in flight. Many pilots also use them for traffic alerts or to drive a backup attitude display in ForeFlight. While these are undoubtedly the most important features, there's another option that many pilots don't use as often: flight data recording.

By default, Stratus 2, 2S, and 3 are always recording during flight, logging position, speed, altitude, and AHRS-driven attitude – up to 20 hours at a time. This recording is automatic, so there's no need to hit start and stop on every flight, a real convenience for busy flight instructors or professional

pilots. Once the flights are logged, though, there are a variety of options for playing back a flight. Let's review the options.

Why use flight data recording?

The term "flight data recorder" may evoke visions of airplane crashes and NTSB investigations, but with Stratus it's much more about making your flying safer and more fun. A track log itself is just a data file; the value is unlocked when it's applied towards specific goals. The best place to start is to consider what type of flying you do and what your flying goals are.

While the potential uses for these detailed track logs are almost endless, in our experience there are four main applications:

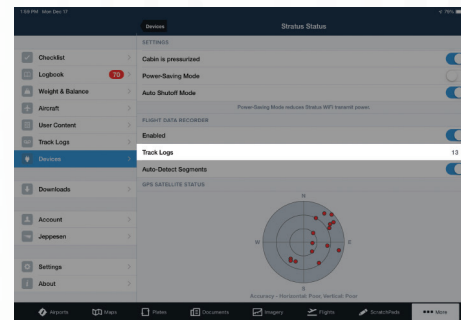
- **Flight training:** A motivated student or a forward-thinking instructor can get a lot of value out of reviewing slow flight, S-turns, or short field landings on an iPad – after a lesson. Instead of trying to explain complicated concepts in the less-than-ideal classroom of a general aviation cockpit, a data-driven debrief can focus on specifics. Apps like CloudAhoy (see below) make it easy to identify specific maneuvers, so you can grade that rectangular course or steep turn against the precise ACS standards. In particular, the AHRS data from Stratus adds valuable pitch and bank data.
- **Instrument proficiency:** How well did you fly that ILS approach? Was your holding pattern entry precise? It's often

hard to answer such questions under the hood (or in the clouds). With a 3D track log, though, it's simple to find out how good your instrument skills are. Our favorite use is to overlay a track log on an instrument approach chart to see exactly how stabilized your approach was.

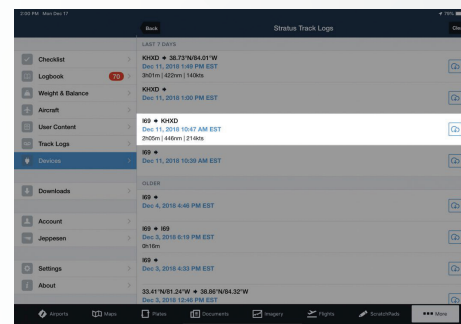
- **Interactive logbook:** A simple text entry is sufficient for your logbook to be legal, but many pilots enjoy saving more details about each flight. In addition to pictures and notes, a track log is a great way to relive a flight months or years later. It's also helpful for watching your skills evolve over time: is your airspeed control better now than it was two years ago?
- **Fun flying and sharing:** Track logs aren't just for pilots. They can also be a great way to share your aerial adventures with friends, family, and other pilots. We like to use either Google Earth (see below) or CloudAhoy's 3D cockpit view to help other pilots understand what it's really like to fly a particular flight.

How to find Stratus track logs

To access Stratus track logs, turn on Stratus and connect it to your iPad via WiFi. Then open ForeFlight -> tap More -> Devices -> then Stratus. At the bottom of the Stratus Status menu, tap on the line that says Track Logs to view all your recent flights.



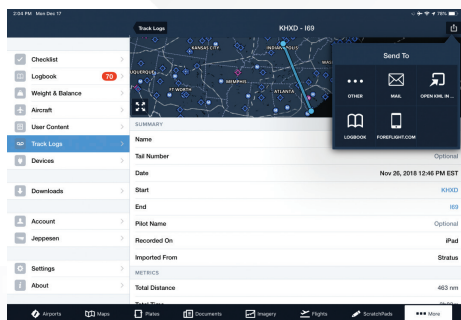
From here, you can choose a specific flight and tap the download symbol at the right to transfer the track log from Stratus memory to ForeFlight.



Sharing track logs

Once you've transferred a flight to

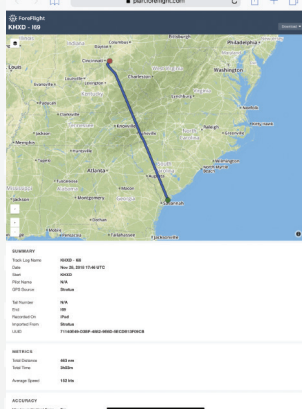
ForeFlight, it will appear in the Track Logs page (also accessed from the More button). This will probably show a combination of track logs recorded by your iPad (GPS only) and by Stratus (which includes more data, like attitude). Tap on a track log to view details, then tap the arrow at the top right corner to share the track log. The standard email option is easy for sharing your flight with friends. Even better is the Logbook option, which will start a new logbook entry in ForeFlight, populated with all the relevant flight details.



The "Open KML In..." and "ForeFlight.com" options are where smart pilots can really unlock the value of track logs. These allow you to export your track log to another program and debrief your flight in great detail. Three in particular are worth exploring: ForeFlight.com, CloudAhoy, and Google Earth.

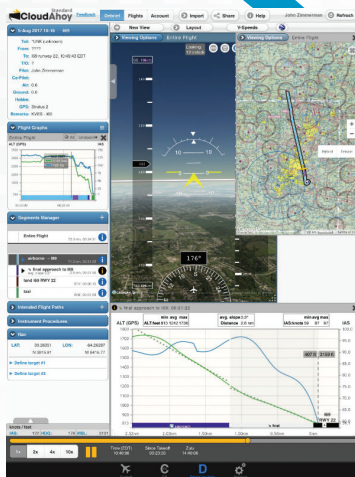
Viewing track logs on ForeFlight.com

The fastest and easiest option is to choose ForeFlight.com from the share menu shown above. This allows you to view any track log on ForeFlight's website for a nice summary of the flight, complete with an interactive map. Tap the layers button at the top left to choose from a variety of basemap options, then scroll down to read trip statistics.



CloudAhoy

For the most detailed post-flight debrief, we like the CloudAhoy app. To share a flight from ForeFlight to CloudAhoy, tap the same arrow button at the top right of ForeFlight, then choose Open KML in... then select



CloudAhoy from the list of available apps (make sure the app is installed on your device).

Once the track log is open in CloudAhoy, you can play back the entire flight, from GPS track to pitch and bank. There are powerful options for overlaying your flight on aviation charts, satellite images, and even a glass cockpit view. The app will also auto-detect flight segments for you, perfect for approaches or landings. In the screenshot below, you'll see a graph on the left side for airspeed and altitude, then a 3D glass cockpit view next to a sectional chart, and finally an expanded speed/altitude graph below

CloudAhoy does require a subscription, but you can download the app for free and try it for 30 days.

Google Earth

The last option is Google Earth, a free app for iPad. From the same Share menu in ForeFlight choose Google Earth (again, make sure it's installed on your device). There aren't nearly as many options as CloudAhoy, but the app is free, easy to use, and you can review your flight path overlaid on a satellite image anywhere in the world. One nice option is to turn on the 3D mode on the left side of the screen and visualize your climbs and descents.



Stratus 3 ADS-B Receiver
6647A \$699.00

NEW ADS-B WEATHER PRODUCTS NOW AVAILABLE!

TURBULENCE



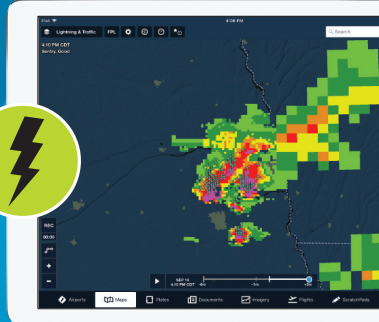
This forecast product estimates the maximum level of turbulence from 2,000' MSL to 24,000' MSL.

CLOUD TOPS



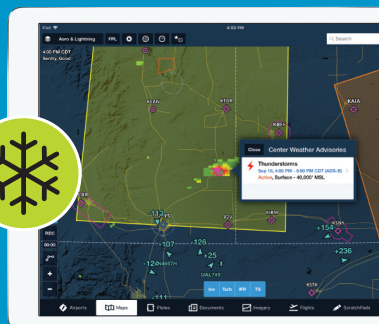
This displays the location of cloud tops at the selected altitude, from 1,500' MSL to 24,000' MSL.

LIGHTNING



Displays cloud-to-ground strikes. Updated every 5 minutes, this helps assess the severity of storm systems.

CENTER WEATHER ADVISORIES



These bulletins depict areas where active weather systems are developing.

FOREFLIGHT ADDS SUPPORT FOR GARMIN GDL 50, 51, 52



DAVID ZITT

ATP, Flight Instructor
VICE PRESIDENT
Sporty's Academy

A new generation of portable weather receivers has hit the market over the last year, with new hardware from Appareo, Garmin, and uAvionix offering new features and (in general) lower prices. ForeFlight recently announced support for the latest receivers from Garmin, which means new options for pilots – especially in the world of satellite weather. Here are the details.

Hardware options

Garmin's current lineup replaces the popular but aging GDL 39 with three products, all with GPS and built-in batteries.

In-flight weather for tablets and portable GPSs

Garmin's GDL series of portable weather receivers can take your tablet or portable GPS to the next level, with datalink weather, GPS position, and backup attitude information. The compact receiver sits on your glare shield and streams all this information wirelessly via Bluetooth to your tablet running the Garmin Pilot app or a Garmin GPS. It's everything you need to make smarter in-flight decisions. There's a model for every type of pilot - choose whether you want ADS-B weather (ground-based network, subscription-free), SiriusXM weather (satellite-based, requires monthly subscription), or both. Plus, get a backup synthetic vision with the GDL's built-in attitude heading reference system (AHRS).



The GDL 50 includes a dual band ADS-B receiver (978 and 1090 MHz) plus GPS and AHRS for backup attitude. For pilots who prefer satellite weather, the GDL 51 swaps out the ADS-B receiver of the GDL 50 for a SiriusXM antenna. The all-in-one GDL 52 includes both ADS-B and SiriusXM.

Which model is best?

While the GDL 50 faces stiff competition from the Stratus 3 and Sentry, it is compatible with ForeFlight, Garmin Pilot, and Garmin portable GPSs, a unique mix of options. The GDL 51 is more of a niche product (the lack of ADS-B traffic is deal breaker for some pilots), but it is a great replacement for the SiriusXM SXAR1 – which is discontinued.

In our opinion, the GDL 52 is the most interesting product here. There simply isn't another portable receiver that combines as many features into one unit. It's a great way to view high quality SiriusXM weather, while still receiving ADS-B traffic and backup attitude information. It is not inexpensive, but the feature list is long and the \$200 rebate gets the price under \$1000.

Software Integration

We went flying with the GDL 52 and ForeFlight to see how the pair worked. In short, just like you'd expect.

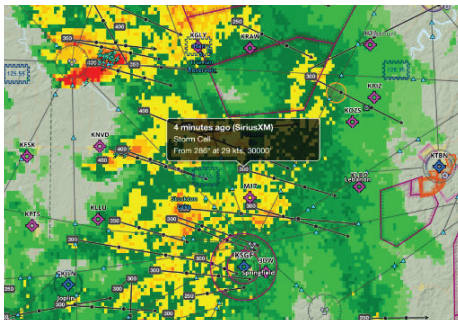
We placed the GDL 52 on the dash of the Cirrus SR22 we were flying, flipped up the antenna on the back, and turned it on. Then we went to the Settings app on the iPad to pair via Bluetooth with the GDL 52.

You can check complete status information in ForeFlight by tapping the gear symbol at the top of the Maps page, then Garmin Connex at the bottom of the menu (that's the name for all of Garmin's connected cockpit products). This menu includes battery condition, SiriusXM subscription level, and much more. It's also a great place to review the age of your weather products. One important note – SiriusXM audio controls are not available in ForeFlight.

On the Maps page, you can select the same layers you're used to seeing, including METARs, winds aloft, TFRs, and PIREPs. The traffic display worked just like a Stratus or Sentry, with targets displayed on the map.

WHAT'S THE DIFFERENCE?			
	GARMIN GDL 50	GARMIN GDL 51	GARMIN GDL 52
ADS-B	✓		✓
SIRIUSXM WEATHER		✓	✓
SIRIUSXM RADIO		✓	✓
WAAS GPS	✓	✓	✓
AHRS	✓	✓	✓
BATTERY LIFE	8 hours	7 hours	5 hours
CONNECTION	Bluetooth	Bluetooth	Bluetooth
PRICE	\$699.00	\$649.00	\$1149.00
PRODUCT NUMBER	7261A	7147A	6241A

One benefit of SiriusXM weather is the additional weather products, like satellite and enhanced radar imagery. Below is a screenshot of the storm cell feature, which shows tops and movement for convective cells. Simply tap on a cell marker to read the details:



You can also compare base and composite radar, which is helpful on low level flights. Composite shows the strongest returns from all altitudes over an area, while base shows mostly what is coming out the bottom of the cell. Here's a comparison, first with composite:



And then base, which doesn't look quite as intimidating. You wouldn't want to fly through this at 8,000 feet, but it does suggest some of the rain on the leading edge of the line isn't hitting the ground.



The GDL 52 also drives synthetic vision with a real-time pitch and bank indication. This was rock solid for us, although it's worth noting that the only calibration option here is to zero pitch and bank.

For more tips see, iPadPilotNews.com

ADS-B TRAFFIC 101

Portable ADS-B receivers for the iPad (like the Garmin GDL 50 and the Stratus 3) can receive ADS-B traffic in addition to weather. But unlike weather, which is broadcast continuously, traffic is only transmitted in response to specific prompts. This can make ADS-B traffic very confusing—when does it work and when doesn't it work?

To help, we've created this series of graphics, which shows three common scenarios.



The most likely scenario, where you are flying with a portable ADS-B receiver, but do not have an ADS-B Out transponder installed in your panel. Here, you'll receive any airplane that is transmitting ADS-B Out via air-to-air (no ground station required). Most airplanes do not have ADS-B Out, so this is fairly limited. You will not see regular, Mode C targets.



In this case, you are still flying with a portable ADS-B receiver and no ADS-B Out in your airplane, but you are close to another aircraft that is ADS-B Out equipped. In this case, that ADS-B Out airplane is waking up the ground station and is receiving a custom traffic picture for a 30 mile "hockey puck" around that airplane. If you are close enough to that airplane, your portable receiver can listen in on that traffic message. While you won't get a complete traffic picture, you will get a better one, since the ground station transmits Mode C targets in addition to ADS-B targets.



This is the best possible case. You have an ADS-B Out transponder in your airplane, so you are transmitting out to the ground stations and creating your own "hockey puck" of traffic information. You'll see all traffic within a 30 mile diameter and 3,500 ft.



To watch the video, see:
iPadPilotNews.com



ADS-B
SCENARIO
#1



ADS-B
SCENARIO
#2



ADS-B
SCENARIO
#3

FAA REOPENS \$500 ADS-B OUT REBATE PROGRAM



CHUCK GALLAGHER

Private Pilot, Repairman Certificate
PRESIDENT
Cincinnati Avionics

Towards the end of 2018, the FAA relaunched its popular rebate program for ADS-B Out avionics. This allows aircraft owners to get a \$500 check from the FAA for upgrading to meet the 2020 mandate, but there are specific steps you have to follow so here's a review.

At the most basic level, your airplane must have a compliant ADS-B Out transponder. This hardware must be installed and connected to an approved position source (WAAS GPS) to continue flying in airspace that currently requires a Mode C transponder after the January 1, 2020 deadline. Conversely, you're perfectly legal to continue flying in rural parts of the country, below 10,000 ft. MSL and outside of Class B and C airspace without having to buy or install an ADS-B out transponder.

The next key element to understand is that portable ADS-B receivers, like Stratus, Sentry or Garmin's GDL receivers, can only be used for ADS-B In services and cannot be used to meet the 2020 ADS-B Out mandate.


To be ADS-B Out compliant you must have an FAA-approved ADS-B out transponder. ADS-B Out is a surveillance technology for tracking aircraft – it's what ATC needs to manage traffic. It reports your aircraft's

position, velocity and altitude once per second. This transmission is received by ATC and nearby aircraft and this data makes up the equivalent of a radar display.

This ADS-B Out transmitter must be a remote- or panel-installed, certified solution (again, no portable ADS-B Out option). An approved WAAS GPS source is also required, to make sure your reported position is accurate. This GPS source may come from a connected GPS navigator or via an internal GPS chip built into the transponder. Remember, though, there is no mandate for ADS-B In equipment.

There are lots of good options available for ADS-B out transponders today, including the Stratus ESG, Garmin GTX 335, and uAvionix skyBeacon. You'll also see there are two types of transponders that broadcast on either the 1090 or 978 MHz spectrum, sometimes referred to as 1090ES and 978 UAT. See page 15 for more details.

While ADS-B out transponder prices have come down since the first models hit the market several years ago, you're still looking at an average price of \$2,000-\$3,000 plus installation. The good news though is that the FAA is stepping up again and helping to reduce some of the expense, by relaunched the \$500 ADS-B transponder rebate program.

This second phase of the rebate runs through October 11, 2019, and is available to U.S.-registered, fixed-wing, single-engine piston aircraft first registered before January 1, 2016. Your selected transponder must have received an ADS-B Technical Standard Order (TSO) authorization and meet ADS-B Out rule requirements. 

HERE'S HOW TO TAKE ADVANTAGE OF THE PROGRAM:

Step #1

- Select equipment for purchase
- Ensure your aircraft registration information is up-to-date in the FAA Aircraft Registry
- Discuss the plans with a certified installer to ensure it will work correctly
- Once an appointment is scheduled to install the avionics, you are ready to reserve your rebate

Step #2

- When within 90 days of avionics installation, reserve your rebate at <https://adsbrebate.faa.gov/RebateReservation.aspx>
- Receive your Rebate Reservation Code

Step #3

- Install the TSO-certified ADS-B avionics on your eligible aircraft

Step #4

- Fly per program rules within 60 days of installation to validate equipment performance (30 minute flight in Class B, C or E airspace above 10,000')
- Receive incentive code

Step #5

- Within 60 days of the installation date, use your Rebate Reservation Code and Incentive Code to claim your rebate

HOW TO CHOOSE THE BEST GPS FOR YOUR IPAD

External iPad GPSs were one of the first accessories to appear for the iPad. After the iPad was released in 2010, pilots quickly realized that the tablet was far more useful with an accurate position source – moving maps, terrain warnings and so much more come into play. Let's survey the market.

Do you need a GPS?

If you own a WiFi-only model iPad, it's simple – you have no built-in GPS so you definitely need one. However, LTE model iPads (ones with the cellular radio in it) have a built-in GPS receiver. But while the

1090MHz SOLUTIONS

These are basically upgraded transponders, and replace your existing Mode C transponder in the panel. 1090MHz is the standard worldwide and is approved for use at all altitudes, so there are fewer restrictions compared to 978MHz. These all-in-one solutions are a great option if you're looking to replace an older transponder.

STRATUS ESG



- ADS-B Out transponder meets the FAA mandate
 - 1090ES technology – no altitude or geographic limitations
 - Integrated WAAS GPS for an all-in-one solution
 - Transponder replacement – upgrade your old analog model
 - Connects to Stratus portables
- Certified**
16800A \$2995.00
Experimental
22311A \$2795.00

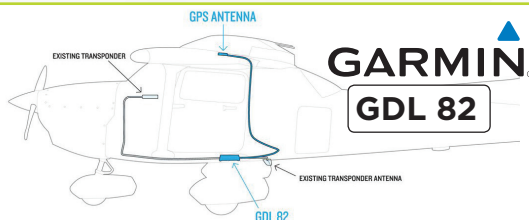
GARMIN GTX 335



- Complete ADS-B Out solution that satisfies the mandate
 - 1090 MHz transponder works at any altitude
 - Built-in WAAS GPS means nothing extra to buy
 - Easy upgrade for an older transponder; fits in 1.65" slot
 - Includes altitude encoder and USB charger
- 5960A \$3195.00**

978MHz SOLUTIONS

These are allowed in the United States only, and below 18,000 feet. 978MHz systems also require aircraft owners to maintain their existing Mode C transponder, so they are a good option if you have a modern digital transponder like a GTX 327. If you have an older, analog transponder like a KT76A or a Narco, we suggest a 1090MHz solution.



GARMIN GDL 82

Looking for a low cost, easy-to-install ADS-B Out system that keeps your existing Mode C transponder in place? Garmin's innovative GDL 82 is the perfect solution. This 978 MHz UAT can be installed between your existing transponder and transponder antenna, so there's no need for extensive panel work. Also includes a WAAS GPS for total compliance.

5838A \$1795.00



uAvionix skyBeacon

The skyBeacon replaces your wingtip navigation light with a simple, compact solution to become ADS-B Out compliant. Remove your old light and install the new skyBeacon in the same location. Three wires, three screws, and an easy setup app is all it takes for most installations. Works with any mode C or mode S transponder.

8004A \$1849.00

on-board GPS does work with all popular aviation apps, it was really designed for ground use and it's not always as reliable in the air. For this reason, many iPad pilots – even those with an LTE iPad – opt for an external GPS. It's pretty cheap insurance.

More recently, with the exploding popularity of portable ADS-B receivers like the Stratus and GDL 50, external iPad GPSs have faded in popularity just a bit. If you have a full-featured ADS-B receiver, you do not need a separate GPS, since most of them include one already. However, if you're just getting started with the iPad and don't want to spend \$500-\$1000 for an ADS-B receiver, a GPS represents a great way to get started.

Note that GPSs are app-agnostic – that is, they work with almost any app because Apple builds "location services" into its core iOS functionality. Many of these GPSs are also compatible with Android devices.

Basic or deluxe

The next question is whether you want

a basic, lower cost model or a deluxe model. The three main features of the higher end models are: longer battery life, data logging functions and the ability to connect to multiple iPads simultaneously – a nice feature for two pilot crews or for connecting to a phone for backup. None of these are necessarily must-have features, but if you'll be flying regularly with a GPS, the longer battery life is worth it.

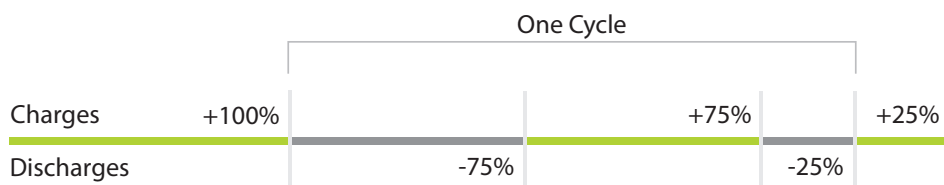
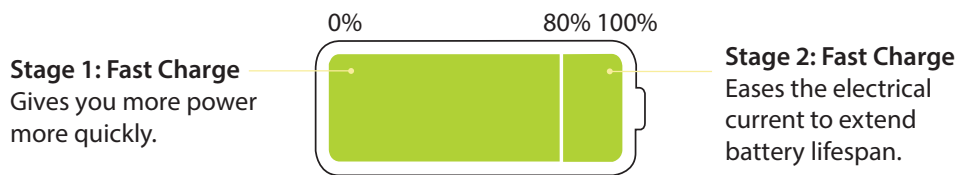
Two models are available in this deluxe class. Bad Elf offers their Pro+ GPS with all of these advanced features, plus an altimeter, for \$249.99. Dual offers their XGPS160 model for \$149.95.

iPAD GPS BUYER'S GUIDE

						
iPAD GPS	DUAL XGPS150A	DUAL XGPS160	GARMIN GLO 2	BAD ELF PRO	BAD ELF PRO+	BAD ELF PLUG-IN
CONNECTION LIMIT	1 device	5 devices	4 devices	5 devices	5 devices	1 device
BATTERY LIFE	8 hours	10 hours	12 hours	16 hours	35 hours	N/A
DATA LOGGER		✓			✓	
SCREEN				✓	✓	
CONNECTION	Bluetooth	Bluetooth	Bluetooth	Bluetooth	Bluetooth	Lightning plug
PRODUCT #	9044A	7100A	7700A	4753A	8634A	5786A
PRICE	\$99.95	\$149.95	\$129.95	\$149.95	\$249.95	\$99.99

Tips for better performance

HOW TO MAXIMIZE IPAD BATTERY LIFE



One charge cycle is complete after you've discharged 100% of your battery's capacity.



ERIC CARNAHAN

Flight Instructor
CUSTOMER SERVICE ADVISOR
Sporty's Pilot Shop

One of the most under-appreciated features of the iPad is its fantastic battery life. Even with a high-resolution screen and a powerful processor, Apple's tablet offers a battery life of 4 to 6 (or more) hours in the air—better than almost every other competing tablet. This is a huge advantage in the cockpit, as it'll last for the duration of all but the longest flights.

But there are a number of things you can

do to improve the performance of your iPad battery and keep it in top working condition. First, it's important to know what type of battery the iPad (and the

"The iPad battery will rapid charge to about 80% which is ideal for pilots."

iPhone, for that matter) uses, and how it works. Like most consumer electronics, the iPad uses a lithium-ion polymer battery, often called a LiPo battery. These are the standard in portable devices now because they have a high power density but are very lightweight. Another major advantage of LiPo batteries is the way they are charged. There is no "memory effect" like older Nickel Cadmium batteries, so you can charge your iPad anytime you want and even leave it on a charger overnight. The battery will also charge very rapidly, to about 80% in a few hours, while the last 20% is more of a trickle charge and takes longer. LiPo batteries also hold their charge for a long time, so a fully charged iPad that is stored for a month will still have most of its charge.


So far we've talked about the "battery life," meaning how long the iPad will run on a

single charge. But Apple also specifies a "battery lifespan," which is the number of times you can charge and discharge the battery before it starts to lose capacity. The iPad was designed so that, after 1000 charge/discharge cycles, it will still have 80% of its battery capacity. Note that it's not considered a "charge cycle" every time you plug in your iPad. If you used 20% of your iPad's battery life every day for 5 days, and recharged it each day to 100%, that would be one charge cycle. So 1000 charge cycles is actually quite a long time (probably years of use for most people).

"A cycle does not mean a single charge - it requires a full 100% charging period."

With that background in mind, here are some tips for getting the most out of your iPad's battery:

- Heat can permanently reduce battery life, especially if you use your iPad at temperatures higher than 95° F. The cockpit certainly can get that hot, so the best advice is to never leave your iPad in the airplane and never place it in the sun. Also, charging the device when it's over 95 is even worse, so try to do your charging at home if you often fly in hot conditions.
- Cold conditions (below 32°F) can also affect battery performance, but this is a temporary issue. Again, you shouldn't store your iPad in the airplane on a cold night, but once it warms up the battery should give you normal life.
- Use your iPad regularly. Lithium-ion batteries are meant to be used hard, so don't be afraid to use and recharge your iPad often. In fact, if you don't regularly use your iPad, you should perform a complete charge cycle at least once a month (where you fully discharge the battery, then charge it up to 100%).
- Adjust screen brightness and wireless radio settings for maximum battery life. If you don't need the screen at max brightness, turn it down—this can significantly reduce battery drain.
- Use the battery utility in the Settings app to monitor what apps are using battery life.

One downside to the iPad battery is that there is no way to replace it in the field. If your battery needs service or replacement, it must be sent back to Apple or taken to an Apple service provider. 

NEW FLIGHT GEAR BATTERY PACK IS THE BEST CHARGING OPTION YET

Keeping all your portable devices charged in the cockpit isn't easy. Most pilots fly with an iPad, a smartphone, and a GPS or ADS-B receiver. Some carry much more, like a backup iPad or an Iridium communicator. There are hundreds of options for keeping all those batteries charged, from cheap to very expensive (and we've flown with many of them), but a new option from Flight Gear is our favorite one yet.

The Flight Gear battery pack is a sleek white brick, about 8" long and less than half an inch thick, but it packs 20,000 mAh of power. That's enough to charge an iPad multiple times, but that's not what makes it unique. The reason we've made it a permanent addition to our flight bag is because it's ideal for the cockpit.

Our number one complaint about most backup batteries is the proprietary cables that are used to keep them charged. When you need to charge your battery before a big trip, there's usually a mad scramble to find some odd-shaped plug buried in a kitchen drawer. With the Flight Gear battery pack, you have plenty of options. It will charge with a micro-USB cable (common on thousands of devices, including many Android smartphones), a USB-C cable (found on Stratus ADS-B receivers and MacBooks), or a Lightning cable (which works with iPads and iPhones). That means you'll almost always have the right cable to keep this battery pack charged, because you already own one.

Another frustration with cheaper battery packs is that they lack the high amp ports that pilots need. While 1 amp is enough for a phone, iPads, ADS-B receivers and other sophisticated devices need 2.1 or 2.4 amps. This battery pack has plenty of those:

- One 3 amp USB port
- One 2.4 amp USB port
- One 2 amp USB port
- One 3 amp USB-C port

While the battery pack will eventually max out if you plug too many devices in, we have successfully



MICHAEL WOLF

Commercial Pilot, Multi-engine
PRESIDENT AND CEO
Sporty's Pilot Shop

charged two iPads and a Stratus (all of which require 2+ amps) at the same time. You can also charge the battery pack while you charge another device, and a four-light status indicator on the side lets you know how much power is left.

The Flight Gear battery pack is at home in the cockpit. We've flown many flights with it in a variety of aircraft and have had no radio interference, a common problem with some battery packs (although the charging cable is usually the weak link). It's also white so it stays cool in the sun. There's even some helpful reference information printed on the back.

Safety is another concern in the tight confines of a general aviation airplane, and this battery has a lot of built in monitoring features. It is continually protecting against:

- Temperature fluctuation
- Over-voltage
- Over-charge
- Over-current
- Over-discharge
- Short-circuit protection

The Flight Gear battery pack is available now for \$79.95.

There's also a Flight Gear cigarette lighter charger and a Flight Gear wall charger, both with dual 2.4 amp charging ports. The best option is to buy all three – the battery pack, cigarette charger, and wall plug – as a kit for \$99.95.



Flight Gear Backup iPad Battery The all new Flight Gear Backup Battery for iPad is the pilot's answer for charging mobile devices on the flight deck. This battery packs some serious power, 20,000mAh of capacity to be exact. Two 3 amp, one 2.4 amp and one 2 amp USB port deliver enough power to charge multiple iPads at the same time while those iPads are being used by the pilots. **6639A \$79.95**



Flight Gear Dual USB Charger Two USB ports provide up to 4.8 amps (2.4 amps each), giving plenty of power to an iPad and a Stratus at the same time. Besides charging your devices, an integrated LED screen displays the voltage of the cigarette lighter socket it is plugged into. When you plug a USB device into it, the screen changes to show the amount of amps your device is drawing. Works in 12 and 24 volt aircraft. **8022A \$18.95**



Flight Gear Dual USB Smart Charger Keeping your portable devices topped off is essential to stress-free flight. iPads, smartphones, tablets, GPS units, ADS-B receivers... all need to be charged before heading to the airport. This dual USB charger provides all the power you need to keep your devices fully charged. With 2 ports providing 2.4 amps each, it will keep even the most power-hungry iPads charged. **6638A \$16.50**

BUY ALL 3!

Flight Gear Charging Bundle
B1124A \$99.95



BRET KOEBBE

ATP, Flight Instructor
VICE PRESIDENT
Sporty's Academy

HOW DO I MOUNT THE IPAD IN MY AIRPLANE?



Securing your iPad while you fly is important for safety (to prevent your tablet from flying around the cockpit), but also for convenience (to keep it close by and easy to use). There are plenty of different mounts to choose from, but they aren't all universal. Which one is right for you? It depends a lot on the type of airplane you fly. Let's look at some examples.

Cessna high-wing (C152, C172, C182, etc.) Almost any mount will work in these popular airplanes, but our two favorites are the suction cup and the yoke mount. The yoke mount now uses an improved Claw design, which is easier to install and does a better job keeping the iPad in place on the yoke shaft.

The suction cup is easy to put up and remove, making it a good choice for renters. It keeps the iPad off the yoke, so it doesn't block any instruments, but it's still easily viewed. We like the side window, angled toward the pilot.

If you want to mount your iPad with one of these options, but don't want to remove your case each time, consider the X-Grip option instead of the form-fitting cradle. This provides the flexibility to secure your iPad with the case on while still using a yoke or suction mount.

Cirrus or Cessna Corvalis – With the side stick, one popular option is out the window for these airplanes (the yoke mount), but there are still some good choices. Again, the suction cup mount works well here, but be careful about where you mount it in the side window – the iPad can interfere with the side stick in some configurations.

For this reason, some pilots choose an iPad kneeboard instead, and with plenty of room in your lap this is a good setup. One final option we've seen work in some of these airplanes is to use the yoke mount, but attach it to a bar underneath the panel. Here, the iPad can be angled out towards the pilot, with the arm coming out from the bottom. This is convenient when installed on the co-pilot side.

Piper and Mooney – Like high-wing Cessnas, the suction cup mount and the yoke mount are two good options here. One thing to keep in mind for these airplanes is that kneeboards may not work very well. Oftentimes the yoke is very close to the pilot's legs in these cockpits, so the yoke might hit a kneeboard on takeoff or landing.

Beech – Most of these airplanes have a much larger control column than Cessnas and Pipers, so pilots of these airplanes need to use the special Beech Yoke Mount. This attaches to the large control column that parallels the panel.

Small/Mid-Size Jets – There aren't many great options for these airplanes, since the yoke design varies dramatically between models. The kneeboard option is our preferred choice, since it stays out of the way of floor-mounted yokes. The other mount we've had success with is the double

suction cup mount from RAM. This holds firmly to the side window, and most jets have enough cockpit space to accommodate this mount without interfering with the instruments or the controls. This is the approach many airlines use.

Other Mounting Options – All of the mounts above are from RAM Mounts, the de facto standard for cockpit mounts. These work well and are affordable, but two newer companies offer a higher end alternative for those pilots willing to spend a little more.

First up is the PIVOT case and mounting system. This hard-sided case was developed by a Southwest Airlines pilot and offers serious protection. The complete system includes a quick-release suction cup mount that is ideal for the side window.

MyGoFlight also offers a high quality line of mounts, including a suction cup and a yoke mount. These have multi-piece arms with multiple joints, so they are almost infinitely adjustable.

Another option from MyGoFlight is an adjustable cradle to hold your iPad in its case. The Universal iPad Cradle is compatible with any tablet from 7" to 11", while the Universal XL Tablet Cradle is designed for larger tablets like the 12.9" iPad Pro.



The double suction cup mount is a good option for jets and turboprops.



MyGoFlight offers a line of mounts that are almost infinitely adjustable.



MyGoFlight

MyGoFlight Flex Systems Features three independent joints, all adjustable and lockable from a single control knob. Extends up to 10.5" in length to get the iPad right where you need it. Custom systems for the iPad Mini and iPad Air include a cradle that snaps around your tablet.

Yoke Mounts

iPad Mini 4	B1991A	\$248.00
iPad Pro 10.5"	B3250A	\$258.00
iPad Air 1-2 and Pro 9.7"	B2050A	\$258.00
Universal Phone	B2292A	\$198.00
Universal Tablet	B1261A	\$278.00

Suction Cup Mounts

iPad Mini 4	B1982A	\$248.00
iPad Pro 10.5"	B3002A	\$258.00
iPad Air 1-2 and Pro 9.7"	B2013A	\$258.00
Universal Phone	B1369A	\$198.00
Universal Tablet	B1900A	\$278.00



PIVOT

PIVOT iPad Cases PIVOT combines a simple, robust case with a sleek mounting solution. This system has quickly become a favorite of many airline pilots—over 8000 pilots at Southwest Airlines are using the case in daily flight operations. It's tough enough to work in any cockpit, but the case is also perfect for everyday use as your main iPad cover.

iPad Mini 4	1824A	\$149.95
iPad Air 2, Pro 9.7"	B1049A	\$174.95
iPad Pro 10.5"	B1063A	\$174.95
Universal 1" Ball Adapter	4913A	\$12.95
Leg Strap	7889A	\$39.95

RAM MOUNTS

RAM® Perfect Fit Mounts



These mounts, our most popular, feature custom designed cradles to fit your iPad securely, so there's no movement in flight. Due to their tight fit, they will not work with cases.



Claw Yoke Mounts

iPad Mini 1-3	2476A	\$66.95
iPad Mini 4	1602A	\$67.95
iPad Air 1-2 and Pro 9.7"	5938A	\$69.95
iPad Pro 10.5"	4585A	\$69.95
iPad 1-4	2095A	\$71.95
iPhone 6+, 7+, 8+	7374A	\$55.95
iPhone 6, 7, 8	7338A	\$55.95

Suction Cup Mounts

iPad Mini 1-3	6618A	\$51.95
iPad Mini 4	1494A	\$52.95
iPad Air 1-2 and Pro 9.7"	4866A	\$54.95
iPad Pro 10.5"	9635A	\$54.95
iPad 1-4	5311A	\$56.95
iPhone 6+, 7+, 8+	6146A	\$39.95
iPhone 6, 7, 8	7114A	\$39.95

RAM® X-Grips



These spring-loaded cradles can adjust to fit different size tablets, including iPad, Android and Windows. Simply squeeze the mount to open it up, place your tablet in the middle and let go. Rubber pegs will hold tight without scratching your expensive electronics.



Claw Yoke Mounts

7" Tablet	3201A	\$79.95
10" Tablet	2219A	\$119.95
Phone	4282A	\$64.95
"Phablet" (Large Phones)	7228A	\$64.95

Suction Cup Mounts

7" Tablet	5565A	\$64.95
10" Tablet	3160A	\$103.95
Phone	5457A	\$49.95
"Phablet" (Large Phones)	6066A	\$49.95

Double Suction Cup Mounts



Need some extra holding strength? These mounts use two heavy-duty RAM suction cups to provide an extra-firm base. Great for mounting heavy items and preferred by airline pilots.



iPad Air 1-2 and Pro 9.7"	5209A	\$74.95
iPad Pro 10.5"	8755A	\$74.95
iPad (1-4)	4741A	\$76.95
iPad Mini (4)	1669A	\$72.95
iPad Mini (1-3)	4815A	\$71.95

For more mounts see,
pages 20-21 →

FINALLY - AN IPAD MOUNT WITH BUILT-IN FANS



MARK WIESENHAHN

Recreational Pilot
VICE PRESIDENT
Sporty's Pilot Shop

Since it was first introduced over six years ago, the iPad has suffered from two consistent two complaints: screen glare and overheating. The screen glare problem has steadily improved, with the addition of stick-on screen protectors and most recently the new screen on the iPad Pro. It may not be solved, but it's getting close.

The overheating problem has also improved, especially from the notoriously hot iPad 3 model, but it remains a concern for many pilots – especially those flying in Florida and the Southwest US. After an hour in the sun, the dreaded "black screen of death" may appear, alerting you that the iPad has shut down to protect its lithium battery.

There is finally a good option for those pilots, with the release of the X-Naut Active Cooling Mount. This iPad cradle has a vented case and built-in cooling fans that direct airflow over the back of the iPad,

aimed at the areas of the tablet that run the hottest. It may sound like overkill, but we've flown with it and the X-Naut really works.

The fans (4 on the iPad Air/Pro model and 2 on the iPad Mini model) are impressively quiet and have been tested to ensure they do not interfere with cockpit electronics. The cradle is powered by AA batteries (8 for the iPad Air/Pro model and 4 for the iPad Mini model) so it's completely wireless, running for over 10 hours on a single set of batteries. Pilots can also use a USB charging cable to power the cradle. There's even a handy battery test button and indicator light on the side of the X-Naut, so it's simple to track battery status.

The mount is well made, with conformal-coated electronics to resist moisture and dust and sturdy battery compartment locks. A spring-loaded clip on top makes it fast and easy to insert your iPad and there's only a simple power button to turn on. Note that it will not work with an iPad case, but that's probably a bad idea anyway for pilots concerned about heat.

While the X-Naut is not a miracle cure (you can still get an iPad to shut down if it gets hot enough), our experience has been very positive. In almost all normal conditions – high wing/low wing, direct sun/indirect sun – it prevents overheating. Two years of customer reviews generally agree, with high marks for cooling performance. Here's a representative quote:

"I flew with a friend from Torrance (KTOA) to San Bernardino (KSBD) and back, in a low-wing plane with a clear green house



X-Naut Cooling Mounts

iPad Cooling Case This ingenious new mounting system solves iPads overheating with built-in fans to circulate cool air, specifically targeted at the iPad's main hot spots. Runs off eight AA batteries (four for the Mini) so there are no wires.

iPad Mini (1-4)	2071A	\$179.99
iPad (Air 1-2 and Pro 9.7")	7960A	\$199.99
iPad Pro (10.5")	7901A	\$199.99
Kneeboard Kit	7741A	\$39.99
Case with RAM Double Suction Cup (Mini 1-4)	6035A	\$239.99
Case with RAM Yoke Mount (Mini 1-4)	6385A	\$239.99
Case with RAM Double Suction Cup (Air 1-2 and Pro 9.7")	6233A	\$249.99
Case with RAM Yoke Mount (Air 1-2 and Pro 9.7")	6710A	\$249.99

canopy. The sun was shining brightly and it was a hot day. I used my X-Naut with my iPad Pro 9.7, and it worked perfectly for the entire 2-hour flight. My friend used his iPad mini, without an X-Naut, and his iPad overheated and shut down about mid-way through the outbound leg."

The X-Naut itself includes the case with the fans. There are various mounting options, including a kneeboard kit to strap it to your leg, and adapters for RAM Mounts and MyGoFlight.

NEW - a universal mounting system for phones and tablets

You shouldn't have to buy a new mount every time you upgrade your phone. The Robust Universal Phone Suction Cup Mount will fit all smartphones up to 3.6" wide including all iPhone models. The Robust Universal iPad Suction Cup Mount will fit all iPad and tablets. With an infinitely adjustable arm, heavy-duty suction cup, and quick grip clamp, this mount will quickly become your favorite.

Robust Universal iPad Suction Cup Mount B4410A \$39.95
Robust Universal Phone Suction Cup Mount B4400A \$29.95



HOW DO DIFFERENT SIZES OF IPAD FIT IN AN AIRPLANE?



ERIC RADTKE

ATP, Flight Instructor
PRESIDENT
Sporty's Academy

We get a lot of questions from pilots looking to get the best size iPad for their cockpit. It's a difficult thing to visualize without actually getting the device inside the plane; on top of that, you want to compare one size device to the next. There are over a dozen different sizes of iPads and iPhones that you could be using for your EFB app. In this article, we're taking a look at the most commonly asked-about sizes. With that in mind, we didn't examine some of the older generation iPads that might still be hanging on. If that's your iPad, well it might be time to upgrade to a newer, faster, more capable unit and this article should help you decide.

Let's consider seven different size devices in the same Cessna 172 cockpit to see what fits best. We mounted the iPads and iPhone in two ways: with a suction cup and with a yoke mount. We were able to mount nearly every device to the yoke with the exception of the new 12.9" iPad Pro 3rd Gen. Not only would it be too big but there isn't yet a cradle capable of holding it.

For the suction cup mount, we tried to use our favorite mounting spot – the bottom of the windscreen that wraps around to the left-hand side. This spot sort of extends the glare shield if you line it up right and helps you keep the iPad in your natural instrument scan. A few of these iPads proved to be too big for this location, so we opted to move the suction cup mount to the right-hand side of the plane by the copilot. With the iPad angled toward your view and out of the way of the yoke, it was definitely a good option for those flying with big iPads.

We wanted to give you a reference for the size and potential placement of these

devices in the cockpit. Some of these pictures are to prove that it's not feasible to mount the pictured device as we have. Remember that the final decision to mount your iPad or iPhone is up to the pilot in command, who must consider the safety risks associated with adding gear to the flight deck. Always be sure that you mount your devices with flying in mind first – the last thing you want is to flare on final and find your mount is in the way.

Here are the devices we mounted in our C172.

- iPhone XS Max
- iPad Mini 4
- iPad Air (same size as the Air 2, Pro 9.7 and 2017 iPad)
- iPad Pro 10.5
- iPad Pro 12.9 (First Generation)
- iPad Pro 11 (Newest Model)
- iPad Pro 12.9 (3rd Generation, Newest Model)

Which iPad do I have?

If you're not sure which iPad you have, it's okay, you're not alone. Please note that we loathe the naming convention Apple has chosen for the iPads as much as you do. It's difficult to be sure which iPad you have but if you need to look that information up here's how you do so.

First, identify your iPad's Model Number. Go to Settings > General > About. You'll see it listed here on the Model line. If you see a different format of the model number (something like MTFL2LL/A), tap on it once to view it in the format below. Then reference the chart to the right.



iPhone XS Max



iPhone XS Max



iPad Mini 4



iPad Mini



iPad Air



iPad Air



iPad Pro 11



iPad Pro 10.5



iPad Pro 12.9 (3rd Generation)



iPad Pro 12.9 First Generation

Name	Year	Model Number
iPad (original)	2010	A1219 (WiFi) or A1337 (cellular)
iPad 2	2011	A1395 (WiFi) or A1396/A1397 (cellular)
iPad (3rd gen)	2012	A1416 (WiFi) or A1430/A1403 (cellular)
iPad (4th gen)	2012	A1458 (WiFi) or A1459/A1460 (cellular)
iPad (5th gen)	2017	A1822 (WiFi) or A1823 (cellular)
iPad (6th gen)	2018	A1893 (WiFi) or A1954 (cellular)
iPad Air	2013	A1474 (WiFi) or A1475/A1476 (cellular)
iPad Air 2	2014	A1566 (WiFi) or A1567 (cellular)
iPad Mini (original)	2012	A1432 (WiFi) or A1454/A1455 (cellular)
iPad Mini 2	2013	A1489 (WiFi) or A1490/A1491 (cellular)
iPad Mini 3	2014	A1599 (WiFi) or A1600 (cellular)
iPad Mini 4	2015	A1538 (WiFi) or A1550 (cellular)
iPad Pro 9.7"	2016	A1673 (WiFi) or A1675 (cellular)
iPad Pro 10.5"	2017	A1701 (WiFi) or A1709/A1852 (cellular)
iPad Pro 11"	2018	A1980 (WiFi) or A2013/11934/A1979 (cellular)
iPad Pro 12.9" (original)	2016	A1584 (WiFi) or A1652 (cellular)
iPad Pro 12.9" (2nd gen)	2017	A1670 (WiFi) or A1671/A1821 (cellular)
iPad Pro 12.9" (3rd gen)	2018	A1876 (WiFi) or A2014/A1895/A1983

IPAD KNEEBOARD BUYER'S GUIDE

Every pilot should secure their iPad in the cockpit, for both convenience and safety. The most popular ways to do this involve either a mount or a kneeboard, and it usually ends up being a bit of a "Coke or Pepsi" debate. Some pilots just love iPad mounts, while others hate them and prefer kneeboards. There's not really a right answer for everyone; it depends on the pilot and the airplane.



iPad Rotating Kneeboard

These kneeboards win hands down for simplicity and value. The basic version offers nothing more than a way to secure the iPad to the pilot's leg. It's not fancy, but it works well, and allows you to switch between portrait and landscape orientations quickly. The elastic leg strap is comfortable and adjustable.

This will work with iPad Air 1, Air 2, 9.7" Pro, 10.5" Pro and iPad Mini. At just \$19, it's an unbeatable value – probably worth owning for backup if nothing else.

iPad Mini	5039A	\$18.95
iPad Air, Pro 9.7"	4908A	\$18.95



Flight Gear HP

This all new bi-fold design opens up to reveal an iPad mount on the left side and storage pockets on the right. In typical use, the right flap will hang down on the side of your leg, with two pockets accessible. These are a great place to store your cell phone, screen cleaners or charging cables. There's also an elastic strap for a stylus or pen, plus a zippered pocket.

Features:

- Four elastic bands lock the iPad kneeboard into place
- Removable board permits both vertical and horizontal mounting options
- Contoured back and elastic strap securely hold the kneeboard on your leg
- External chart pocket and ID holder
- Two internal, low-profile side pockets
- Zippered pocket with protective flap to protect iPad screen
- Pen/stylus holder
- Accepts Gear Mods

iPad Mini	5829A	\$34.95
iPad Air, Pro	5027A	\$34.95



MyGoFlight

For a premium option, MyGoFlight offers two styles of kneeboards for iPad pilots. First, the Folio C includes both a custom iPad mount and a metal writing surface. The writing desk attaches with magnets, so it's easy to attach it to the front or it can be attached to the left panel of the bi-fold kneeboard when open. The Folio C includes a leg strap and closes up neatly for a professional look outside the cockpit.

The MyGoFlight Folio C Kneeboard range in price from \$149 to \$169. MyGoFlight

has options for all kinds of devices including the iPad Air 1, Air 2, 9.7" Pro, 10.5" Pro, iPad Pro 12.9", iPad Mini 1-4, and even for your smartphone. These kneeboards aren't cheap, but they are well made, good-looking and highly-functional.

The second option from MyGoFlight, called the iPad Sport kneeboard, is more of a minimalist design. Constructed of black, smooth polycarbonate, the Sport adds protection and great feel to the iPad. Ideal for aircraft where space is tight or where there is a cyclic or control stick being used between the legs. This kneeboard is also designed to work with the Sport Adapter found on MyGoFlight's yoke and suction cup mounts, making it great for pilots wanting both a kneeboard and mounting solution. \$149.00

Mini 1-4	6621A	\$154.00
iPad 2-4, iPad Air, Pro 9.7"	7250A	\$154.00
iPad Pro 12.9"	5850A	\$174.00



MyClip

This simple but elegant kneeboard has been around for a while, and we still like it. It's the smallest kneeboard we've seen, so if you're flying in a tight cockpit, it's an excellent choice. It's also very adaptable, fitting all iPad sizes, from iPad Mini to iPad Pro 12.9", with or without a case. If you like to leave your protective case on, this is easily the best option. Just pull the rubber gripping surfaces apart, position the iPad and release – the elastic straps hold the kneeboard in place and prevent your iPad from moving around. It's well-made and durable, and it takes up virtually zero space in your flight bag. The only downside is that it offers no storage or protection for your iPad. The MyClip is available for \$34.95.

If your iPad has a larger case, we recommend MyClip's larger option, the MyBig Kneeboard, which is perfect for Otterbox or LifeProof cases.

MyClip 6624A \$34.95
MyBig 8026A \$34.95

These kneeboards are covered with soft, leather-like material and feature a wide leg strap to hold the kneeboard in place during flight. A holding clip on the front provides a place to secure a notepad or other paper documents you might need to reference. Inside, the kneeboard is covered with a soft microfiber to protect your iPad. The built-in adjustable easel provides tilted viewing angle. The power port is accessible with the cover closed and a back cover window exposes the camera lens for easy picture taking. ASA's iPad kneeboard is a good value.



ASA

iPad Air, Pro 9.7" 7249A \$49.95

The kneeboard has a simple but well thought out design, with the iPad sitting in the middle, held steady by four elastic arms, so they accommodate iPads with and without cases – although very thick cases like the Otterbox won't fit. The iPad section can swivel, so it rotates from landscape to portrait with one hand. It's firm enough to stay in place, but it doesn't require latches or buttons. There are two mesh pockets for storing essential iPad accessories like a charging cord or a cigarette lighter charger. But the feature we like the most is the flip-down area on the right side of the iPad. It can function as a storage pocket, but we think it's even better as a shelf. The Flight Outfitters iPad kneeboard is compatible with iPad Air 1, Air 2, 9.7", 10.5" Pro (\$69.95) and iPad Mini (\$59.95).



iPad Mini 7344A \$59.95
iPad Air, Pro 7178A \$69.95

Flight Outfitters

KNEEBOARD BUYER'S GUIDE



KNEEBOARD	FLIGHT GEAR Rotating		FLIGHT GEAR Bi-Fold		FLIGHT OUTFITTERS		MYGOFLIGHT Folio C			MYCLIP		ASA
iPAD COMPATIBILITY	Mini 1-4	Air 1-2, Pro 9.7" and 10.5"	Mini 1-4	Air 1-2, Pro 9.7" and 10.5"	Mini 1-4	Air 1-2, Pro 9.7" and 10.5"	Mini 1-4	Air 1-2, Pro 9.7" and 10.5"	Pro 12.9"	Any tablet from 3" to 12" wide	Any tablet from 3" to 12" wide	Air 1-2, Pro 9.7"
FITS iPADS WITH CASES	Thin cases	Thin cases	Thin cases	Thin cases	Thin cases	Thin cases	No	No	No	Yes, up to 0.45" thick	Yes, up to 1" thick	Thin cases
CLIPBOARD							✓	✓	✓			✓
POCKETS			✓	✓	✓	✓						✓
ROTATING iPad HOLDER	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
TILTING iPad HOLDER			✓	✓								✓
PRODUCT #	5039A	4908A	5829A	5027A	7344A	7178A	6621A	7250A	5850A	6624A	8026A	7249A
PRICE	\$18.95	\$18.95	\$34.95	\$34.95	\$59.95	\$69.95	\$154.00	\$154.00	\$174.00	\$34.95	\$34.95	\$49.95

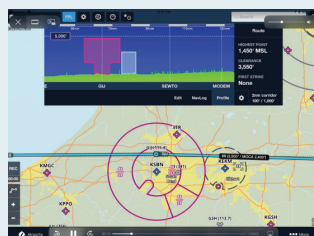
TOP 15

IPAD APPS FOR PILOTS

The number of aviation apps seems to expand daily, with thousands of options for flight training, weather briefings, games and so much more. With that in mind, compiling a list of the top apps may seem foolish, but we're going to try – after all, a brand new iPad pilot needs to start somewhere. The list below isn't necessarily our 15 favorite apps, but rather the ones we see in use most often, and are worth considering for any pilot's tablet:

ForeFlight Mobile This is the app that has, probably more than any other, revolutionized the way pilots view the iPad. The all-in-one pre-flight and in-flight product includes moving maps, approach charts, terrain awareness, weather graphics, weight and balance, flight plan filing and a whole lot more. It has replaced paper charts and even portable GPSs for a lot of pilots, especially as products like the Stratus ADS-B Receiver and the GDL 52 SiriusXM Receiver have come onto the market.

Garmin Pilot Garmin practically invented portable navigation products for pilots, and they've extended this expertise to tablet and phone apps. This impressive app includes many of the same features as ForeFlight, and adds Garmin GTN-style menus, split screen, GDL 50/51/52 integration, international charts and more. It's also available on Android.



#1



PRICE
\$99.99/YR
ANDROID

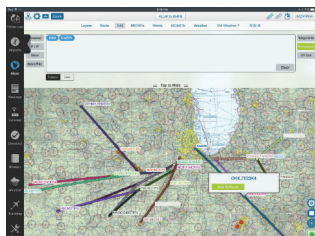


#2



PRICE
\$74.99/YR
ANDROID

FltPlan Go The free FltPlan.com website continues to be one of the most widely used flight planning services around today, especially for corporate aviation. This free companion app allows you to retrieve and store your navlogs and weather briefings and includes FAA charts, moving map navigation, checklists, weather imagery and more. It has slowly evolved into a complete Electronic Flight Bag (EFB) app.

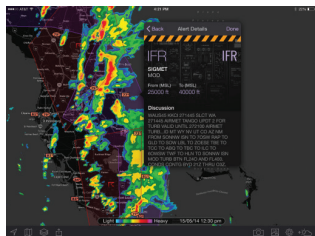


#3



PRICE
FREE
ANDROID

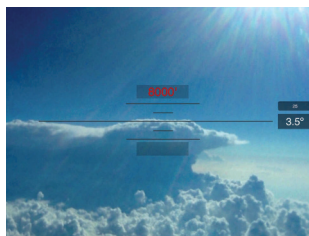
MyRadar This free app is simple, but it's fast and easy to use. MyRadar shows looping NEXRAD radar for the entire US that is easy to zoom in on – perfect for pre-flight weather briefings. Recent updates have added some nice aviation features, like TFRs, AIR/SIGMET overlay and route overlays based on N-numbers.



#4



PRICE
FREE
ANDROID



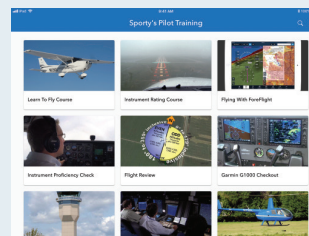
CloudTopper

Will you top that cloud ahead of you? It's not an easy question to answer for many pilots, but this app can help a lot. It uses your phone's camera and gyroscope to make a sight level: point it out the front of your airplane and look for the big black line. At just 99 cents, it's a must-have.

#5



PRICE
99¢
ANDROID

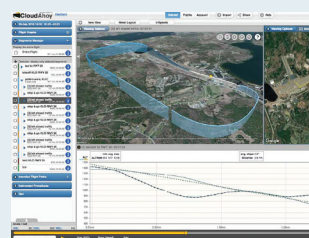


#6



PRICE
FREE
ANDROID

Sporty's Pilot Training As any student pilot knows, there's a lot to learn about flying outside the cockpit, but modern technology makes it much more convenient to learn at home than in a boring ground school. This next generation training app from Sporty's includes their complete Sport/Recreational/Private course, and is a convenient way to prepare for the FAA written test and check ride. It includes over 20 hours of HD video, practice tests, maneuvers guide, syllabus, and more. Plus, 10 other courses help you add ratings.

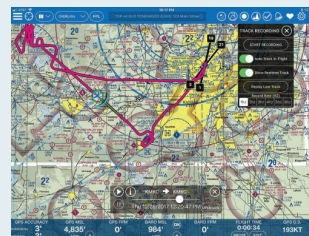


#7



PRICE
\$65.00
ANDROID

CloudAhoy This app is a lot of fun, but it's also useful for currency and flight instructors. Simply open the app and begin tracking (or use a Stratus or G1000 flight data recorder). CloudAhoy keeps a detailed log of your flight, including speed, altitude and location. You can play back the flight over a Google Earth map or an aviation chart, complete with simulated instrument panels and terrain. There's even a CFI mode that makes it easy to review key maneuvers. A big update last year added a number of features to make CloudAhoy better than ever.



#8



PRICE
\$69.99/YR
ANDROID

Aerovie This app began as a niche weather app, focused on soliciting PIREPs, but has since grown up a lot. It now features complete charts, moving map navigation, in-flight weather, flight plan filing, and much more. The focus on weather hasn't disappeared, and the app has a number of advanced maps and forecast tools. Aerovie also has a powerful Apple Watch app. It's free to download and use for many of the essential features; a full subscription costs \$69.99/year.

For more apps see,
iPadPilotNews.com



#9

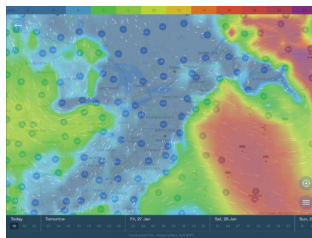


PRICE
\$14.99

ANDROID



Study Buddy This is an easy-to-use but powerful study tool for anyone preparing for an FAA written test. You can study questions by category, complete with answers and explanations, then take timed practice tests. Versions available for Private, Instrument, and Remote Pilot.



#10

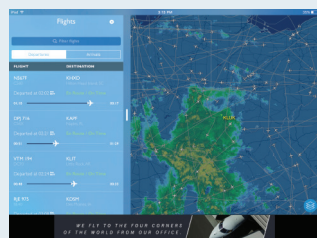


PRICE
FREE

ANDROID



Windy This is a beautiful app, with stunning visualizations of wind conditions up to 240 hours into the future. This is surprisingly helpful for weather planning, and gives you a solid understanding of the big picture. The app has recently added aviation-specific features like METARs and TAFs, making it even more useful for pilots.



#11



PRICE
FREE

ANDROID



FlightAware The internet has made it easy to track airplanes in flight, both airline and general aviation, and there are plenty of good tracking apps available. FlightAware is one of the most popular, with a good mix of features and convenience. Want to see if your friend has landed? Want to see how big your weather diversion was? This free app makes it easy to do that and more.



#12

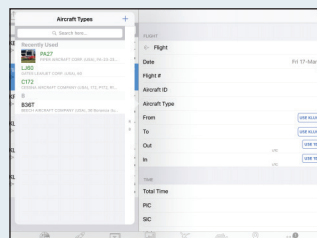


PRICE
FREE

ANDROID



FlyQ InSight A unique approach to in-flight navigation, this app uses your iPhone or iPad camera to create an augmented reality view of the world around your airplane. You'll see nearby airports, complete with distance and bearing, plus weather charts and flight planning.



#13

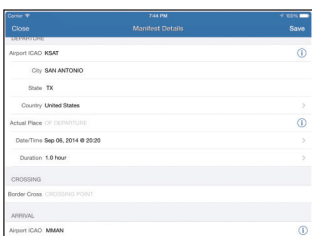


PRICE
\$79.99

ANDROID



LogTen Pro A logbook app makes it a lot faster and easier to keep track of currency, and it's almost a requirement for aspiring airline pilots. LogTen Pro is one of the most powerful logbook apps we've seen, with a ton of customization options, airline schedule interfaces, and plenty of automated reports. It's not cheap, but it's worth it for an active pilot.



#14

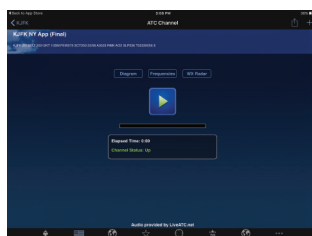


PRICE
\$60/YR

ANDROID



FlashPass Flying to the Caribbean or Canada is a great way to get more utility from your pilot certificate, but it does require filing eAPIS paperwork with US Customs. FlashPass is a much easier way to do this than the cumbersome Customs website. Fast, easy, and approved.



#15



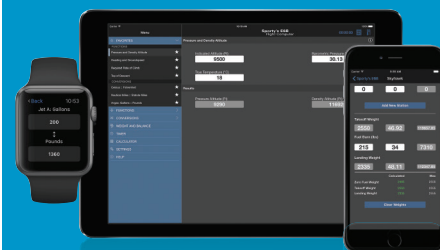
PRICE
\$3.99

ANDROID

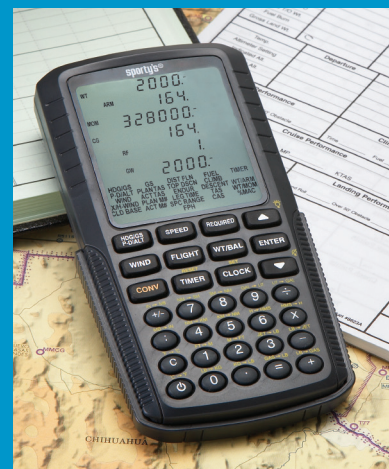


LiveATC Pilots use this app every day to improve their communication skills or just listen in on Air Traffic Control from around the world. It's surprisingly fun and addictive, especially for big events like Oshkosh or the Super Bowl.

SPORTY'S E6B



Sporty's E6B App Sporty's E6B app makes quick work of navigational, weight and balance, or fuel problems, and is a favorite of student pilots. This powerful app includes all the features of the traditional E6B, including 22 aviation functions, 20 conversions, and complete timer features. The iOS E6B App is compatible with iPad, iPhone, and Apple Watch. Not approved for FAA tests. **\$9.99**



Sporty's Electronic E6B Flight Computer Over 250,000 pilots have trusted Sporty's Electronic E6Bs over the years for fast flight planning and accurate FAA test calculations. Our new Electronic E6B has all the easy-to-use features of the original, but adds a new, more rugged design and additional features. Its pilot-friendly design makes quick work of any navigational, weight and balance, or fuel problem, and it also performs conventional arithmetic calculations.

- Approved for use on FAA tests
- Backlit screen for night operations in the cockpit
- Built-in storage case protects the screen when not in use
- Large keypad for easy operation in turbulence

7095A \$69.95

PROTECT YOUR IPAD



Captain's Bag

This bag has plenty of room for all your pilot supplies and a change of clothes. Perfect for the pilot who has more to carry. Measures 18"l x 10"w x 13"h overall. **9903A \$89.95**



Crosswind

Perfect for student pilots and weekend warriors, this bag was designed around the beginning pilot. Enough space for a headset and books, yet small enough to not throw off your weight and balance. Measures 16"l x 8.5"w x 10"h. **5515A \$49.95**



Tailwind Backpack

With dedicated pockets for a computer and iPad, you'll quickly find yourself using this bag every day for business as well as flying. Measures 18"h x 15"w x 10"d overall. **9950A \$99.95**



iPad Bag

The iPad Flight Gear Bag was specifically designed for the iPad pilot with lots of pockets for organization and custom pockets for protecting important electronics. The small footprint of the iPad bag makes it easy to fit on the floor between the front seats in a Cessna. Measures 12"w x 7.5"d x 13"h overall. **10034A \$69.95**



Internal front pocket organizes your gear



PLC Pro Bag

This combination backpack and briefcase is great for pilots on the go who need to protect expensive electronics like an iPad or laptop. Measures 16"l x 14"w x 9"d. **7834A \$229.00**



PLC Sport Bag

The PLC Sport is smaller version of the PLC Pro. Just enough room to carry one headset, an iPad/EFB, a hand-held radio, and other gear. Measures 14"l x 13"w x 6"d. **2298A \$179.00**



PLC Lite Bag

The PLC Lite bag is a great choice for any student pilot flying with an iPad. This bag easily accommodates the essentials without being too bulky. Measures 14"l x 11"w x 6"d. **4683A \$114.00**



MGF

IPAD SCREEN PROTECTORS WHICH ONE IS BEST?



**PILOT YOUR OWN
ADVENTURE**



DOUG RANLY

Private Pilot
CATALOG MANAGER
Sporty's Pilot Shop

Screen glare is a persistent problem for pilots flying with the iPad. The latest iPad Pro models incorporate an anti-reflective coating that is an improvement over the earlier models, but it still can be difficult to view in sunlight or when covered with fingerprint smudges. While smart mounting strategies can reduce it (we've been able to make the iPad screen usable in even bubble canopy airplanes), there's no way to completely eliminate glare. After all, the iPad is a giant sheet of glass. Is there anything pilots can do?

For years, different companies have offered anti-glare screen protectors to help with this problem. We've tested dozens of them and most are, frankly, worthless. A good screen protector should pass four tests with us:

- It is easy to install, without air bubbles.
- It protects the screen from scratches.
- It does not affect the touch-screen interface.
- It cuts glare without dimming the screen.

After countless flight trials over the years, our favorite by a long shot is MyGoFlight's ArmorGlas.

To help illustrate its effectiveness, we installed the protector on a new iPad 9.7"

(a model without the newer antireflective coating), with the screen brightness on maximum, and took it into the cockpit of a Cessna 172 on a sunny fall day – a really difficult lighting situation.

What you see below is a comparison of the iPad with no screen protector compared to the ArmorGlas. It's hard to show in the picture exactly what it looks like in the cockpit, but you get a good idea of each one's performance.

Here's how it stacked

up on our four criteria:

- ArmorGlas is actually a thin sheet of tempered glass, so it's rigid. That means it's fast and easy to install – no bubbles to press out and no thin film flying around.
- The ArmorGlas is thicker than less expensive films, so it provides better protection. We even took a box cutter to it and couldn't scratch the iPad screen.
- Somewhat counterintuitively, the ArmorGlas left the iPad screen more responsive than thinner films. There was almost no difference between it and the naked iPad screen.
- While not a miracle cure, we felt the ArmorGlas did reduce screen glare noticeably. Under our extreme test conditions, the screen still needed to be tilted just a bit to be able to read it clearly, but this was better than no protector and less washed out than the thinner films.



ArmorGlas

Anti-Glare Screen Protectors When it comes to screen protection, nothing is better than the feel and clarity of pure glass. ArmorGlas is like having no screen protector on at all; you won't even realize it's there. ArmorGlas is made of premium, ultra-thin tempered glass material. It is designed to preserve the feel and clarity of the standard screen on your device while adding a substantial level of protection.

iPad Air 1-2 and Pro 9.7"	1651A	\$49.99
iPad Pro 10.5"	7764A	\$49.99
iPad Pro 11"	7942A	\$49.99
iPad Pro 12.9" 3rd Gen	5013A	\$59.99
iPad 2,3,4	8104A	\$49.99
iPad Mini 1-3	1741A	\$49.99
iPad Mini 4	5736A	\$49.99



LIFT

This sturdy bag has room for all the essentials, but won't get in your way. Includes a large headset pocket, iPad pocket and multiple organizer sections with room for all your accessories. **8456A \$99.95**



LIFT XL

The new Lift XL is a larger version of the top-rated Lift Bag, adding more room for storage (including two headsets) and more organization options, all while retaining the signature design features that make Flight Outfitters bags so useful in the cockpit. **10756A \$149.95**



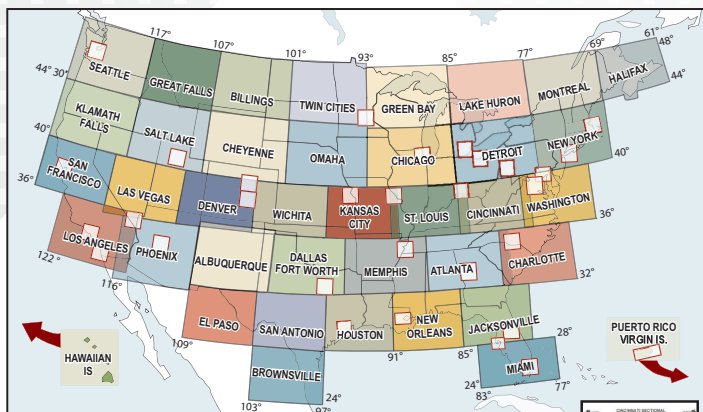
CENTERLINE

This backpack has organization for all the aviation gear you carry, but is versatile enough to use every day, whether you're at the airport, the office or the classroom. There is a dedicated headset slot and a padded tablet/computer pocket. **2750A \$99.95**

CREATING A BACKUP PLAN

The iPad is quite reliable, but no electronic device is perfect. We suggest carrying some type of backup navigation, in addition to a backup power source.

Sectional Charts & Terminal Area Charts



Sectional Charts (Scale 1:500,000) \$9.00 ea.

The most popular charts for VFR navigation. Each depicts land data like cities, rivers and topography, plus airports, navigaids and special use airspace. Please specify the names of the charts you want. Revised semi-annually.

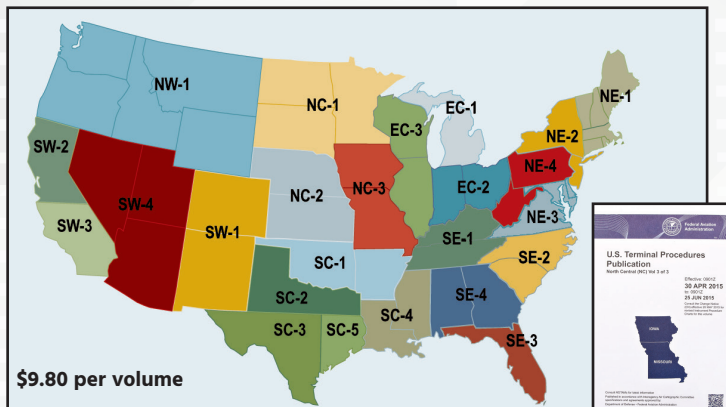
For a complete set of 38 Sectional Charts, order B2003A \$342.00

VFR Terminal Area Charts (TACs) (Scale 1:250,000)

\$6.20 ea. A smaller scale version of sectionals, each one depicts a particular area's Class B airspace, including visual checkpoints. Some include a VFR Flyway Planning Chart on the back. Revised semi-annually.

*A VFR Flyway Planning Chart is printed on back of TAC.
For a complete set of 30 TACs, order **B2010A \$189.80**

Terminal Procedures Publications



\$9.80 per volume

Terminal Procedures Publications (Approach Plates)

Essential information for all instrument pilots. Each book includes instrument approaches, arrival/departure procedures, airport diagrams, takeoff minimums and more. Revised every 56 days. When ordering, please specify chart code, and loose-leaf or bound charts. For a complete set of Terminal Procedures Publications including Change Notices please order **B2004A \$237.20**

Anchorage/Fairbanks

*Atlanta
Baltimore/Washington (Tri-Area)
Boston
Charlotte
Chicago
Cincinnati
Cleveland
*Dallas-Ft. Worth
Denver/Colorado Springs
*Detroit
*Houston
Kansas City
Las Vegas
*Los Angeles
Memphis
*Miami
Minneapolis
New Orleans
New York
Philadelphia
*Phoenix
Pittsburgh
Salt Lake City
*San Diego
San Francisco
San Juan (\$10.00)
Seattle
St. Louis
Tampa/Orlando

CHART STATES

NE1 ME, NH, VT, MA, CT, RI
NE2 NY, NJ
NE3 DE, MD, VA, DC
NE4 PA, WV
SE1 KY, TN
SE2 NC, SC
SE3 FL, PR, VI
SE4 AL, GA
EC1 MI
EC2 IN, OH
EC3 WI, IL
NC1 ND, SD, MN
NC2 NE, KS
NC3 IA, MO
SC1 OK, AR
SC2 TX northern
SC3 TX southwest
SC4 LA, MS
SC5 TX southeast
NW1 WA, OR, ID, MT, WY
SW1 CO, NM
SW2 CA northern
SW3 CA southern
SW4 NV, AZ, UT
CHGE CHANGE NOTICES \$2.00



GPS – Garmin aera 660

The aera 660 is the ultimate all-in-one aviation device - like a glass cockpit in the palm of your hand. It combines complete navigation features, digital charts, hazard alerts and optional in-flight weather with a beautiful 5" touchscreen.

**Garmin aera 660 GPS (Americas)
9201A \$749.00**



Radio – Sporty's SP-400

The SP-400 is simply the most powerful portable radio you can buy—like having a complete standby radio stack in your flight bag. It makes a reliable backup for emergency use, but it's also perfect for listening to ATIS, getting clearances before engine start or just monitoring local traffic. **7758A \$299.00**



Flashlight – Smith & Wesson

Independent switches allow the user to select which color of light is needed without having to scroll through multiple colors. Ten white LEDs provide maximum illumination for outside the cockpit, while three red LEDs preserve night vision in the cockpit. **6010A \$39.95**



How to safely contain a

TABLET FIRE

Lithium ion batteries are modern miracles: they provide enough power for an iPad to run for 6+ hours, they charge quickly, and are lightweight. It's not a stretch to say the electronic flight bag revolution could not have happened without them. But while the safety record of lithium ion batteries is remarkably good considering how many of them are in circulation, fires and explosions do happen. The FAA has published reports for over 40 such incidents in the last year alone.

Unfortunately, lithium ion battery fires are different from most other types because they do not need oxygen to burn. If it's caused by a short, the battery can enter thermal runaway and may even explode. Even worse, traditional Halon fire extinguishers are not very effective on such fires. Watch some video online for an example of just how dramatic a lithium ion battery fire can be.

As a result of this threat, many airlines and corporate flight departments require pilots to carry fire containment systems on all flights. After all, in a pressurized airplane at 37,000 feet, you can't exactly throw the tablet out the window. While these systems work very well, they have been far too heavy and expensive for general aviation pilots to consider – costing well over \$3,000 in some cases.

Fortunately, there's a new option that is both portable and far less expensive. Two sizes of fire containment bag are available, one for tablets/phones and one for laptops. Each has a multi-layer construction: the carbon layer prevents fire, and will withstand 3000 degree Fahrenheit temperatures, while a separate Kevlar layer prevents projectiles from injuring pilots and passengers in case of an explosion. A pair of fire resistant gloves is included for handling the device, making this a complete system. In the event of a tablet fire, just place the device in the bag and close the flap.

The bags are made with FAA-approved materials (in accordance with FAR Part 25.853) and have been tested extensively. There's also a free replacement guarantee for life – if the bag is used to contain a fire, a new bag will be sent out free of charge.

At \$495, the Tablet Fire Containment Bag certainly isn't cheap, but it's dramatically less expensive than most other systems we've seen. It measures 14" w x 10" h x 2" d and can be rolled up for storage. A larger bag is available for laptop computers, which measures 14" w x 17" h x 2" d and costs \$595.



Tablet Fire Containment Bag
3360A \$495.00



Laptop Fire Containment Bag
3162A \$595.00



40+

“fires and explosions due to batteries reported by the FAA last year alone.”

ALL THE GESTURES PILOTS NEED TO KNOW

iPad Pro operation without a home button



JOHN ZIMMERMAN

ATP

VICE PRESIDENT

Sporty's Pilot Shop

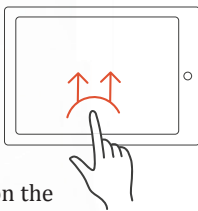


You can do almost everything on your iPad without touching a button – in fact, the new iPhone and iPad Pro models don't even have a home button. Whether it's closing an app, switching apps, opening the control center, or searching for something, iOS has multiple gestures that can save time or unlock additional features. Once you get proficient with them, they can really save time in the cockpit.

If you've been flying with an older iPad (like an iPad Air or Pro 9.7"), the new iPad Pro models may be confusing at first. They do require some new gestures, but once you get used to them, it's quite intuitive. Let's review all the options.

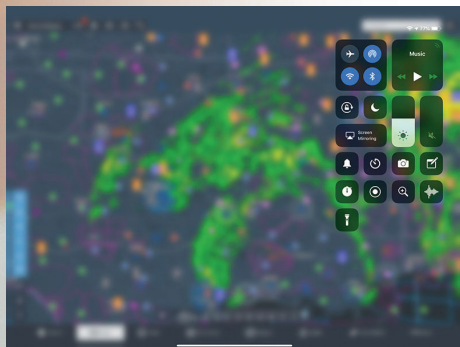
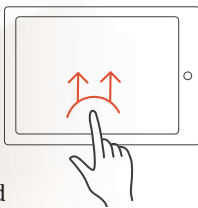
Swipe up (a little) for the app tray –

From any app, just swipe up from the bottom of the screen about an inch to display the tray of favorite apps. The ones on the left are set by you; the ones on the right are auto-filled by the iPad based on popular or recently used apps. This is a fast way to change apps, and it's also how you set up a split screen (see below).



Swipe up (a lot) to close the current app –

This is the home button replacement. Swipe up to about the middle of the screen and you'll close the current app and display the home screen. If you're on one of the secondary home screens, doing this will return you to the first page of apps.



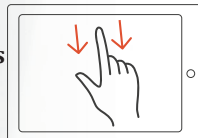
Swipe down from the top right corner for Control Center –

The Control Center provides quick access to some of the most commonly-used settings, including Airplane Mode, WiFi, Bluetooth, and screen brightness. It's also where you turn on the flashlight feature, so this is a frequently-used menu. Make sure you're swiping down from the top right corner.



Swipe down from top middle for notifications and today –

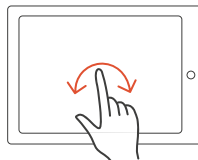
Did you get an alert and want



to review it? Swipe down from the top of the screen (in the middle) to see a list of all your notifications, whether it's a new email or an expected route from ForeFlight. After swiping down, you can also swipe from left to right to display the Today view. This is helpful because this view includes widgets, the little apps that run in self-contained boxes here.

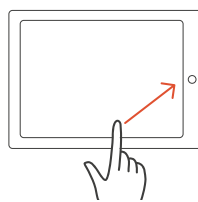
Swipe down from middle for search –

Most people learn this one by accident, but it can be useful if your iPad has a lot of apps. Swipe down from the middle of the screen and you'll see a gray screen with a search box at the top. You can use this to find an app that's hidden in another folder, a contact, or even search the internet. Tap cancel at the top to return to your home screen.



Drag an app from the tray to get split screen –

This is only available on newer iPad models running iOS 11 or later, but it's a powerful feature. While an app is open, swipe from the bottom of the screen to display the tray with favorite and recent apps. Then, tap and drag an app icon to overlay it on the app that's already open. This is a great way to use a checklist app or an E6B app without closing your favorite EFB app. Some apps go a step further and allow a full split-screen view, with two apps side by side. To view this, first drag an app icon out of the tray to display a second app, then drag it to the right side of the screen. You should see your original app resize and both apps will be active at the same time. You can even go from an 80/20 split to a 50/50 split by then dragging the new window from the left edge.



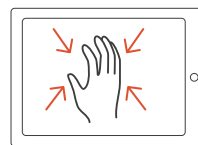
Besides these shortcuts, there are a number of gestures that require four or five fingers – Apple calls them Multitasking Gestures. To activate this functionality, go to Settings -> General -> Multitasking & Dock. The first

setting will enable the multiple app option mentioned above. The third one (Gestures) enables the following shortcuts:

Pinch to the home screen –

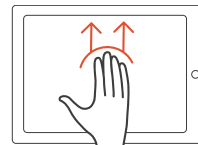
Use this instead of pressing the home button to access the home screen from within any app.

Place four or five fingers spread out on the screen, and pinch together.



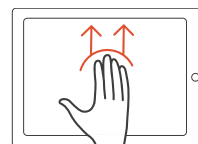
Swipe up and hold to see open apps –

Use this instead of pressing the home button twice (or the single finger swipe from the bottom) to access the multitasking view. Place four or five fingers spread out on the screen, and move your hand upward and pause for a second.



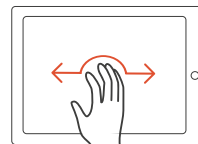
Swipe up from App Switcher to close multiple apps –

Once you've opened the App Switcher (what Apple calls this screen you get after doing the above gesture), you can close apps that are running in the background by swiping up. This doesn't delete the app, it simply closes it down completely. However, you can close multiple apps at the same time by swiping up with multiple fingers. This is handy if you want to close a lot of open apps, which is useful if you're trying to troubleshoot.



Swipe left or right between apps –

This allows quick movement between applications that are currently running. With an app running, place four or five fingers spread out on the screen. Now, move your hand to the left to switch to the last opened app. With the same motion, move your hand back to the right to switch back to the previous app.



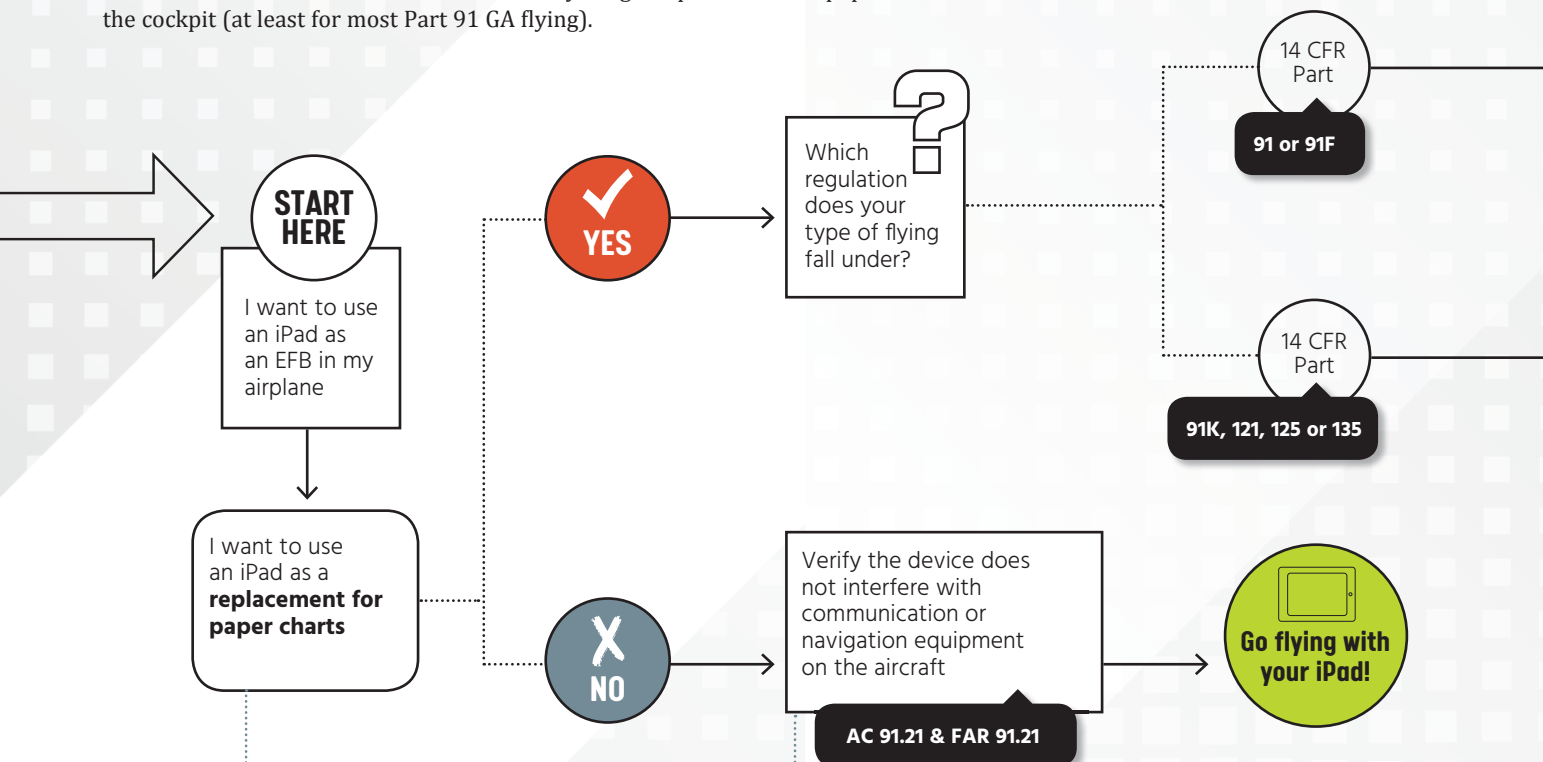
IPAD LEGAL BRIEFING

What Pilots Need to Know

Each year we publish a plain-language review of the FARs and Advisory Circulars pertaining to the use of iPads and electronic flight bags in the cockpit. This is great information for pilots looking to make the transition from paper charts to an iPad, but should also be reviewed by experienced iPad pilots as well. We like to think of it as another step in maintaining pilot currency by staying up with the legalities of using digital devices in flight.

The number one question we get on using an iPad for charts is whether it is “legal” for aviation use. The definition of “legal” depends on what type of flying you do and what you’re using your iPad for, so there’s no one-size-fits-all answer. Here we’ll cover the applicable Federal Aviation Regulations (FARs) and Advisory Circulars (ACs). But first one suggestion: don’t get caught up in all the minutiae.

The short answer is that the iPad is absolutely a legal replacement for paper charts in the cockpit (at least for most Part 91 GA flying).



NOTES

You can use an iPad purely for supplemental purposes.

FAR 91.21 does not apply only to iPads. It covers any electronic device.



iPAD EASY APPROVAL

Ideal for
Part 135
or 121
operations



Verify the device does not interfere with communication or navigation equipment on the aircraft

AC 91.21 & FAR 91.21

Review and comply with **AC 91.78:**

1. Requires a source of data that is the functional equivalent of paper reference material (aviation app)
2. The charts and data in the aviation app must be current
3. A backup source of data is suggested, but not required
4. A transition period is suggested where you still have paper charts available as you learn to use the iPad/EFB during flight


Go flying with your iPad!

Review and comply with **AC 120-76** and gain FAA approval:

1. Establish and document useful battery life
2. EFB must be secured or stowed during critical phases of flight
3. Requires interference testing and compliance (results must be documented)
4. Requires documented maintenance procedures for lithium-ion batteries and UL/IEC safety/testing standards
5. Requires proof that the EFB device will still function after the rapid decompression of the cabin
6. The flight crew must complete a training program on the use of EFBs in the cockpit


Go flying with your iPad!

If you fly Part 91, AC120-76 does NOT apply. However, it's worth reading for some best practices.

The iPad with ForeFlight is quickly becoming a popular choice for paper chart replacement. If you're flying a large airplane (more than 12,500 lbs) or turbine-powered airplane governed by Part 91, Subpart F, or if you're flying as a fractional or an on-demand, Part 135 operation, you'll want to consider a formal approval process. Gaining approval for your iPad as an Electronic Flight Bag (EFB) can be a time-consuming and complicated process – enlisting an expert can save you precious time and resources.

Sporty's Easy Approval includes:

- Detailed description of approval process & plan for execution
- Customized cover letter specific to your flight operation
- Templates & Checklists for initial evaluation and assistance on completion
- Operational Procedures (General Operations Manual (GOM) content)
- Comprehensive Training Program, Testing & Documentation
- Supplemental Flight Deck Checklists
- Portable Electronic Device Non-interference Testing Guidance
- Rapid Decompression Testing Data
- Plan & Templates for flight line evaluation

5201A \$895.00

For more information see,
Sportys.com

How to use the GARMIN D2 DELTA WATCH WITH THE GARMIN PILOT APP



JC MAYERLE

Recreational Pilot
EMAIL MARKETING MANAGER
Sporty's Pilot Shop



use the D2 Delta as a GPS position source for the Garmin Pilot app. Outside the cockpit, the D2 Delta is packed with everyday features, including Garmin Pay contactless payments, music storage, and multi-sport training mode.

Here we're going to show how you can use the D2 Delta with the Garmin Connect app to get the most out of it as an everyday smartwatch.

Pairing the D2 with the Garmin Connect app

Because it was built specifically for the needs of pilots, the D2 Delta doesn't need to be tethered to a phone or iPad in the airplane to provide full navigation and flight performance data, making it an excellent backup navigation tool. For everyday use on the ground though, you'll want to pair it up to your iPhone or Android device to deliver internet connectivity to the watch, along with the full array of smartwatch features (just like with the Apple Watch).

To get started, download the Garmin Connect app to your iPhone. There are a couple key things to remember—the Garmin Connect app is a completely separate app from the Garmin Pilot app, and is only built for phones and not iPads/tablets (again just like the Apple Watch concept).

Next, follow these steps to pair the D2 Delta to your phone:

- **Enter Pairing Mode on the D2**—hold the UP button on the D2 for a few seconds, go to Settings-> Phone -> Pair Phone.
- **Turn on Bluetooth on your phone**—go

to your phone's Settings app and turn on Bluetooth. The important takeaway here is that you cannot pair the watch like you normally would in the Bluetooth settings page. Rather it's done directly in the Garmin Connect app.

- **Pair with Garmin Connect app**—open the Garmin Connect app on your phone, go to More tab and scroll down to Garmin Devices. Tap the blue "Add Device" button at the bottom of the screen and follow the pairing instructions. You'll next enter your personal information and preferences (used primarily for fitness tracking features), and follow the prompts to finalize the pairing.

You'll only need to complete this pairing process once, as the watch will automatically connect again when your phone is nearby.

Using the D2 Delta connected features

The D2 Delta relies on a system of "Widgets" to display small bits of useful information from both its internal sensors and your phone. By default, you'll see widgets displaying sensor data and flight instruments from the compass, altimeter and activity tracker. But when connected to your phone you'll see internet-driven data, like the current METAR for the nearest airport (or any airport you select) and general weather forecasts.

iPhone users will also see all the standard iOS notifications in a dedicated widget, which are loaded from all the apps on your phone and not just those from Garmin. Best of all you can add third-party Widgets to the D2 from Garmin's Connect IQ Store.

When on any screen, you'll also see pop-up notifications and feel a vibration when you receive an incoming call, text message, email, etc. It also constantly monitors your activity and displays all your stats in the Garmin Connect app. This feature makes it a great fitness tracker too, useful for running, biking, skiing or any other workout activity. The Connect app does a nice job of collecting and organizing this data for easy review on your iPhone's larger screen.

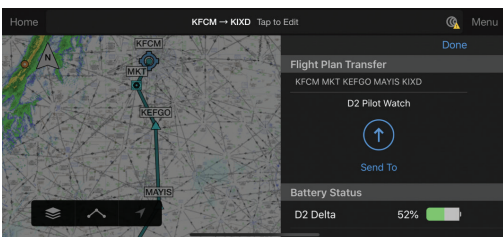
Flying with the D2 Delta PX

Like the previous-generation Garmin aviation watches, the D2 Delta has a dedicated Direct-To button at the top right



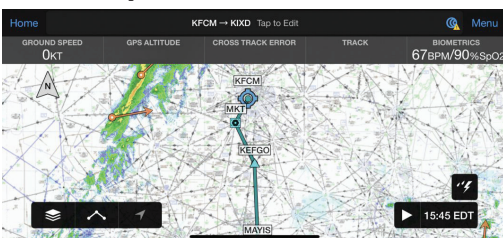
for quick waypoint input – press and hold it to enter this mode. You can also tap this button once to quickly enter the “Fly” mode, which allows you to view navigation details, flight instruments, color moving map and more.

When connected to a device running the Garmin Pilot app, you can quickly send the active flight plan to the watch by pressing the blue Connex symbol at the top of the screen, and then the Send-To button.



The D2 Delta PX device has a wrist-based pulse oximeter to gauge the saturation of oxygen in your blood (SpO2). Knowing your oxygen saturation can help you determine how your body is adjusting to high altitudes. As your altitude increases, the level of oxygen in your blood can decrease. When you view the pulse oximeter widget while you are not moving, your device analyzes your oxygen saturation and your elevation. During a flight, the device automatically takes pulse oximeter readings more frequently, so you can monitor your SpO2 percentage.

You can view this information on one of the D2's default widgets on the watch, or set one of the navigation fields in the Garmin Pilot app to continuously display heart rate and %SpO2.



Garmin Pilot will display an alert if your oxygen level drops below a preset % value, which you can customize from the Connex section of the app.

The D2 Delta can also help you track altitudes, fuel tanks, and more. Configurable pressure altitude notifications provide a series of vibrations when arriving at a selected altitude. A fuel tank timer vibrates at configurable intervals to help remind pilots to switch fuel tanks while in-flight. Finally, a cross track error notification triggers a vibrating alert when pilots deviate from an active flight plan.

GARMIN Connected devices



D2 Delta Watch

The fourth generation of Garmin's popular D2 includes a sleeker model for women and a premium model with built-in pulse oximeter. All three include a built-in GPS receiver that drives an HSI display, full airport database, compass, altimeter, and nearest airport function. You can even connect the watch to your Garmin avionics to share routes and flight data. Outside the cockpit, the D2 Delta is packed with everyday features, including Garmin Pay contactless payments, music storage, and multi-sport training mode. It's the no-compromise smart watch for pilots.

Garmin D2 Delta S Watch (rose gold)	4684A	\$899.00
Garmin D2 Delta PX Watch (titanium bracelet)	7747A	\$1249.00
Garmin D2 Delta Watch (leather band)	5768A	\$949.00



VIRB Ultra 30 Video Camera

The powerful, easy-to-use, and compact VIRB Ultra 30 shoots ultra HD video (4K/30fps) with built-in image stabilization and GPS logging. Plus, the complete kit includes an audio cable for recording cockpit communications, a prop filter to remove distortion and mounts. It's everything you need to create amazing flying videos.

7109A \$499.99



Garmin Pilot App

Garmin Pilot is a comprehensive suite of tools for the iPhone, iPad and Android, designed specifically for general aviation and corporate pilots. Flight planning, filing, charts, interactive maps, weather briefing resources and navigation capabilities; it's all included. The app's intuitive interface mirrors those on the newest Garmin touchscreen avionics so you can go seamlessly from preflight to inflight. Plan, file, fly with Garmin Pilot.

Standard	99017A	\$74.99/year
IFR Premium	99018A	\$149.99/year

HOW TO QUICKLY SCAN DOCUMENTS INTO FOREFLIGHT

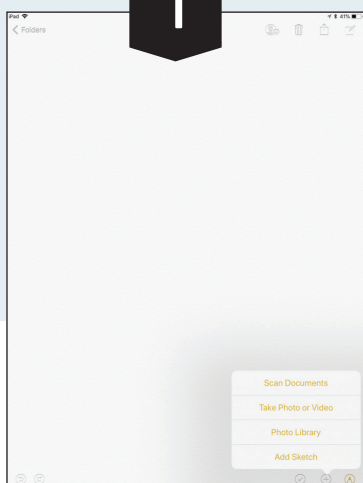


CHRIS CLARKE

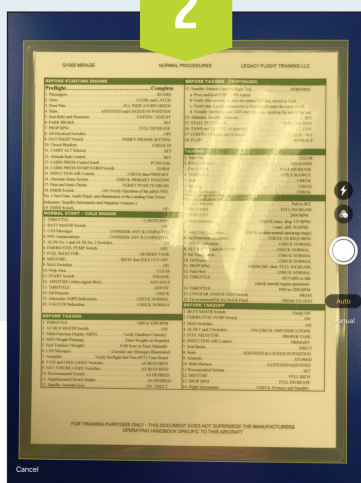
Commercial Pilot
VIDEO PRODUCER
Sporty's Academy

More and more pilots are going completely paperless in the cockpit, but that requires some paper documents to be scanned first. Fortunately, Apple made some significant improvements to the Notes app in iOS 11, including the addition of a powerful scanner utility. This can be used to scan just about any type of physical document or receipt, and save or share it using the traditional iOS methods. The scanned images can even be sent to apps that support document viewing, like ForeFlight or FltPlan Go. Here's how to do it:

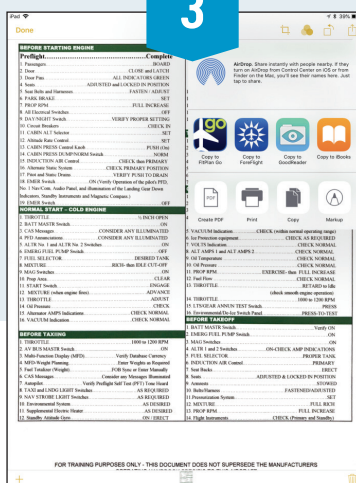
1



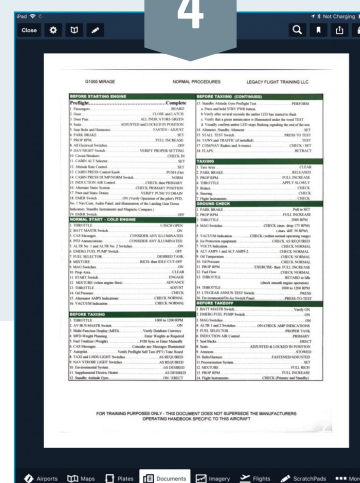
2



3



4



1. Open the Notes app
2. Tap the icon in the upper right corner to make a new note
3. Tap the "+" button in the at the top of the keyboard (this button will be in the bottom right corner of the screen if the keyboard is not in view), and select Scan Documents

4. The camera will activate, allowing you to take a snapshot of the document. Use the button with three circles to choose color, grayscale or black and white.
5. Make sure the yellow box is lined up with your document, and press the white circle camera button to take the picture.

6. Adjust the edges using the small corner buttons around the document to refine the edges of the scan.
7. Press the Keep Scan button in the bottom right corner. If you'd like to add more pages to the document (to create a multipage PDF for example), scan additional pages using the same steps listed above. When finished, press the Save button in the lower right corner.

8. The scanned document will now be saved in the new note, and you can use the share button in the upper right corner to create a PDF, share it or send it to another app. Selecting the "Copy to ForeFlight" option will send it right to Documents, where it'll be stored with your other aviation resources.

We've used the Notes scanner for all kinds of things: checklists, pilot's operating handbook pages, avionics supplements, non-aviation maps, insurance information, fly-in procedures, and even restaurant menus. Once you get the hang of it, the process is fast and reliable – and the app is included on every iPhone and iPad.



For more tips and tricks, visit
ipadpilotnews.com



STAY CONNECTED TO AVIATION

LiveATC app plus Sporty's Air Scan Radio keeps you in touch



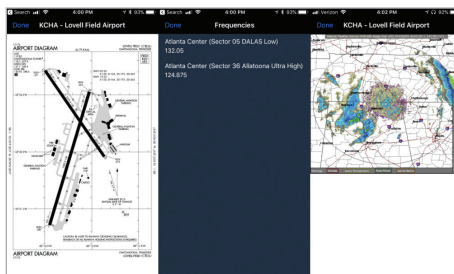
If you're truly afflicted with the aviation disease, you know that listening to other pilots fly is pretty good medicine on those days when you can't fly. Fortunately, the internet and smartphones have made this easier than ever. Whether you're listening to the Fisk arrival at Oshkosh, enjoying the local flavor at Beijing Tower, or just learning proper phraseology from your nearest center frequency, LiveATC.net makes it easy to listen to real pilots and controllers almost anywhere in the world.

The website has been around for many years, but the company's app for iPad and iPhone recently received an overhaul. While the app is fairly simple, it does everything you could want it to – and the latest changes make it much easier to use.

Start by choosing what channel you'd like to listen to. You can choose US locations, sorted by state, or from one of the dozens of other countries in the app. There's also a list of the top 50 most popular channels, which

is a good place to start for casual aviation fans. Many locations offer ground, tower, approach, and en route centers so you can get a complete flying experience. This is especially good for student pilots learning the ins and outs of aviation communications – it's great practice to follow a single airplane from clearance all the way to cruise when possible.

Once you've chosen a channel, the main screen offers everything you need. You can listen to the live audio, review the airport diagram, see the frequencies in use, and even watch the radar picture. This is pretty entertaining when the weather gets ugly around busy airline airports.



New for the latest version is the ability to play LiveATC audio while the app is in the background. That means you can listen to approach control while you read email or type a document. The controls are available

from the built-in iOS control center (swipe up from the bottom of the screen). You can also play this audio through external devices, like a Bluetooth speaker or Apple TV.

For the ultimate AvGeek setup, we paired our iPhone to an Air Scan radio. This desktop scanner receives AM/FM/VHF, has Bluetooth built-in, and also has an Aviation Interrupt function. That allowed us to play far-off center frequencies (via the LiveATC app over Bluetooth) while we monitored local traffic in the pattern with the Air Scan's built-in VHF receiver. When no airplanes were talking in the pattern, we heard Live ATC; when the runway got busy, the radio interrupted the LiveATC broadcast to play local activity. Overkill? Maybe. We thought it was just right.

LiveATC is available for \$3.99 on the iTunes App Store, and also for Android. Sporty's Air Scan Radio is available for \$99.95.



Sporty's Air Scan Radio
With Aviation Interrupt

5173A - NOW ONLY \$99.95

Why **POLARIZED** SUNGLASSES

don't work with the iPad

Many pilots have learned the hard way that polarized sunglasses, an increasingly popular option, don't always play nice with a tablet. Older iPad screens in particular will appear completely black when viewed in portrait mode if you're wearing polarized sunglasses. This is also true of some panel-mount flight instruments, which may have an anti-reflective coating on the front.

There's nothing wrong with the iPad; it's simply a matter of two anti-glare technologies (the polarized lenses on the sunglasses and the polarizing filter on the

iPad screen) combining to defeat each other. On most iPhones, the "extinction" is set to 45 degrees, which does not cause problems.

Some newer tablets do not have this problem, and you can always view the iPad in landscape orientation without problems. But for maximum versatility we recommend non-polarized sunglasses in the cockpit. There are plenty of great options below that cut glare and are 100% compatible with all cockpit avionics.



"Older iPad screens will appear completely black when viewed in portrait mode if you're wearing polarized sunglasses."



iPAD-FRIENDLY SUNGLASSES

RAY-BAN

AVIATOR

Small-55mm, gold

5609A ~~\$149.00~~ \$119.95

Medium-58mm, gold or black

5400A ~~\$149.00~~ \$119.95

Large-62mm, gold or black

5285A ~~\$149.00~~ \$119.95



COCKPIT

8106A ~~\$155.00~~ \$119.95



WAYFARER

1618A ~~\$155.00~~ \$119.95



DUAL EYEWEAR

DUAL AVI

1616A \$99.95



DUAL AV2

Bronze lens 2805A \$99.95

Grey lens 2805A \$99.95



DUAL TX

8019A \$79.95



Built-in readers on each pair!

CLOUDBASE

LEE WAVE

6173A \$79.95



SQUARED AVIATOR

3476A \$79.95



CLASSIC DUSTDEVIL

6344A \$79.95



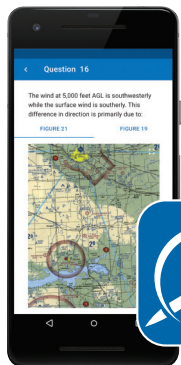
Stratus 3 ADS-B Receiver

This best-selling ADS-B receiver is well-known for its seamless integration with ForeFlight, but it also works with a variety of other apps, including some on Android. Pilots can view in-flight weather, traffic, and GPS position in FltPlan Go, Naviator, and AvPlan EFB, among others.

Sportys.com/Stratus



WHAT ABOUT ANDROID?



Pilot Training App

Sporty's popular video training app includes over a dozen courses, with dynamic in-flight footage and powerful written test prep features. The app is available online, on iPad/iPhone, and on Android - and training progress syncs across devices. It even works on Apple TV and Roku!

Sportys.com/PilotTraining

Garmin Pilot App

The most powerful aviation app on Android (in our opinion) is Garmin Pilot. It is packed with pre-flight and in-flight features, including beautiful weather maps, flight plan filing, complete digital charts, detailed airport information, and a digital logbook. It's compatible with the GDL series of portable weather receivers and with Garmin panel-mount avionics.

Sportys.com/Garmin



Android Kneeboards and Mounts

Most of the kneeboards and mounts made for iPad are universal, so they will fit common sizes of Android phone and tablet. For example, the RAM X-Grip line of mounts uses spring-loaded arms to adapt to a wide range of devices. Sporty's Flight Gear Kneeboards use elastic straps to accommodate 7" and 10" class tablets.

Sportys.com/Kneeboards

The iPad dominates the world of electronic flight bags, with ForeFlight and many other popular apps only available on iOS. But if you're flying with an Android device, there are still plenty of good options. Here are four of our favorite apps and accessories for Android phones and tablets.





Have you recently upgraded to the latest version of ForeFlight or Garmin Pilot and can't wait to fly with the new features, but are stuck on the ground due to bad weather? Well we're happy to tell you that there are options to do some high-tech armchair (or desk chair) flying from the comfort of your home. Both apps integrate with X-Plane and allow you to see your GPS position and movement in these apps, realistically simulating the in-flight experience.

Both flight simulator programs even output AHRS pitch and bank data, allowing you to fly with synthetic vision and learn how to use its full capabilities. We'd suggest a departure out of the Grand Canyon airport, KGCV, and a flight through the canyon river valley to experience the detailed and terrain coloring and shading. But first there are a few setup steps you'll need to accomplish specific to the flight sim program you'll be using.

Setting up X-Plane and ForeFlight

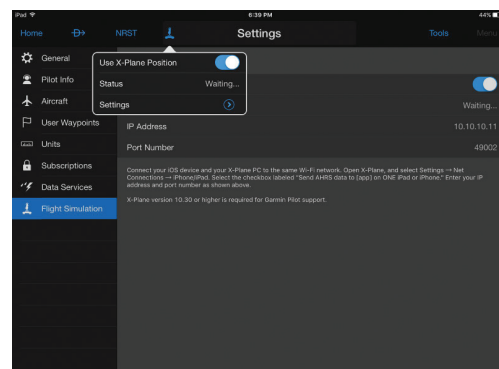
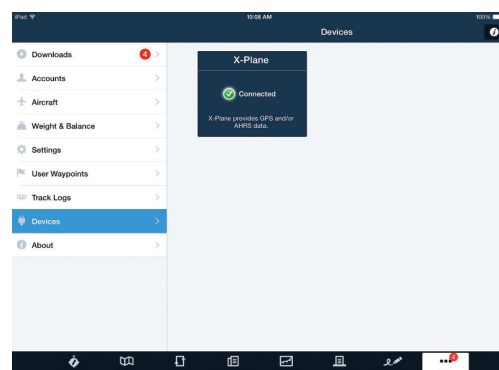
X-Plane is the standard for desktop flight simulator programs today and runs on both PC and Mac. The setup process to connect your iPad is pretty straightforward with X-Plane (version 10.11 or newer) since it is designed to work without additional plug-ins or hardware:

1. Verify network connections – Make sure your iPad and computer are on the same network, with the iPad connected via Wi-Fi.

2. Configure X-Plane settings – Launch X-Plane, select Settings, then Network and click the + next to the IPHONE & IPAD tab. Check the box next to "Broadcast all copies of ForeFlight."

X-Plane will now send your simulated coordinates directly to ForeFlight, positioning the moving maps and airplane symbol to your location in the simulator.

You can verify everything is working properly by going to the Devices section in ForeFlight (in the More tab), and you'll see X-Plane in a blue box. Tap this and verify that the switch





for "Enabled" is turned on. You can also set one of the moving map data boxes in ForeFlight to 'Accuracy', and it will display 'X-Plane' in small font in the window.

Setting up X-Plane and Garmin Pilot

Just like ForeFlight, Garmin Pilot is easy to use with X-Plane.

1. Connect your iOS device and computer to the same Wi-Fi network
2. Start Garmin Pilot and select Home -> Settings -> Flight Simulation, and choose the 'Use-X-Plane' switch
3. Go to your computer and launch X-Plane; select Settings -> Network -> iPhone/iPad
4. Select the checkbox 'Send AHRS data to app' on ONE iPad or iPhone
5. Enter the IP address and Port Number found on the Settings -> Flight Simulation page in Garmin Pilot



X-Plane 11 Flight Simulator

X-Plane has been aviation's best flight simulator for the past decade, with incredibly life-like scenery, detailed cockpits, and realistic aerodynamic modeling. The latest version is a major upgrade, with a new, easier-to-use interface. It's faster than ever to get started, but there are still dozens of options for power users to customize every mission. Choose the airplane, location, and weather to make every flight exactly what you want. Order the download online at sportys.com/xplane.

X-Plane 11 (download) 99524A \$59.99
X-Plane 11 (DVD-ROM) D769A \$59.99



Saitek Yoke with Throttle Quadrant

Yoke features a durable stainless steel shaft with precision bearings for smooth and predictable elevator and aileron control. Built-in stopwatch is perfect for timing approaches and integrated USB hub provides a docking station for other Saitek hardware. Included throttle quadrant features detents for idle and reverse thrusts. Extra throttle quadrants are available for twin engine simulation. Ground shipping only.

Saitek Yoke 9900A \$169.99
Additional Throttle Quadrant 9855A \$59.99

Switch Panel Includes landing gear handle with position lights, magneto switch, battery/alternator switches, 11 other important aircraft functions.
9041A \$99.99

Saitek Rudder Pedals Add realistic yaw control to your flight simulator set up with these USB Rudder Pedals.
9875A \$169.99



CH Products Flight Simulators

Turn your computer flight simulator into a realistic learning experience. The simple control yoke combines elevator and aileron inputs with throttle, mixture and propeller levers. Work the gear, flaps, trim and throttle. The rudder pedals will complete your setup with yaw control and toe braking.

CH Products Yoke 10015A \$139.95
CH Products Rudder Pedals 10133A \$129.95

AirText offers new option for **IN-FLIGHT CONNECTIVITY**



MARK WIESENHAUN

Recreational Pilot
VICE PRESIDENT
Sporty's Pilot Shop

Connectivity continues to be a hot trend in avionics, as ever more pilots and passengers search for a solution that allows in-flight messaging and even phone calls. There are a number of impressive options for large business jets; unfortunately, most of these systems cost over \$100,000, require large antennas, and often cost over \$5,000/month in data fees.

One less expensive option is a portable device like Garmin's inReach (see next page), but it has some limitations. A new option was recently introduced that aims to bridge this gap: AirText. This system allows up to 16 users to connect at any one time, each with private messaging. While it's significantly more expensive than the portable options, it is much less than the business jet systems and has affordable data plans.

We've been flying with AirText for over a year now, and have grown to really appreciate its design and features. It's not for every airplane, but for pilots looking for a reliable and relatively affordable in-flight connectivity solution, it's worth considering.

Hardware

AirText is available in three main versions: AirText LT is a portable version for text

messages, AirText is permanently installed, and AirText+ adds voice calls. All three share the same basic hardware design, which includes a sturdy metal case and small antennas. This can be installed almost anywhere (we've even heard of some being installed inside cabinets to hide the box), and simply requires a connection to the aircraft's electrical system - either wired or with a cigarette lighter plug. The AirText and AirText+ require a connection to a roof-mounted antenna; the LT has its own antenna.

Once the device is installed, simply connect your mobile device to it via Bluetooth (the Settings app on an iPad or iPhone). Up to 6 devices can connect to AirText LT, and 16 devices can connect to the other models, using Bluetooth Low Energy. This makes it handy for charter airplanes where many different passengers may be using it. Like most in-flight connectivity solutions, users must download an app to enable communications, which is free. Once this is downloaded, open the AirText app and you're ready to communicate.



AirText uses the Iridium satellite network, like the Garmin inReach, so coverage is truly global. You can send and receive messages anywhere on Earth, and from any altitude.

Iridium is very slow compared to full internet systems, but as you can see below, it still supports a number of useful features.

Text messages

The most popular feature will surely be text messaging. Open the AirText app and choose the first tab, labeled Messages. This allows you to initiate and respond to text messages, and connects to your contacts list for auto-fill functionality. It works just the way you would expect, with the standard 140 character limitation. As mentioned above, one of the key advantages of AirText is that each app user can send messages without the rest of the airplane reading them.

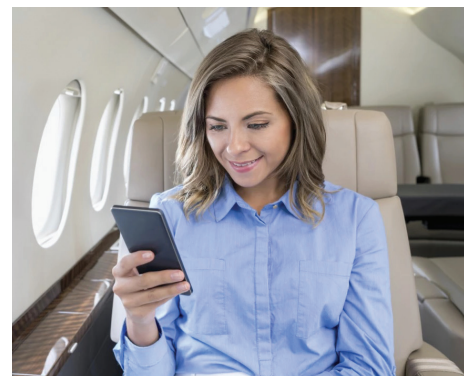
This is a completely two-way system,

so recipients can quickly reply to your message from their native messaging app - there's no need for them to download anything special. When receiving text messages, your phone will display a notification just like a normal text message, except it will come from AirText.

Since you're communicating through the Iridium satellite system, your messages actually come from a different phone number (the Iridium number tied to the AirText box). This can cause some confusion for first time message recipients, so we recommend sharing the Iridium phone number before flight. This will allow frequent contacts to associate that number with your contact ("Steve's AirText," for example).

Automatic notifications

The AirText app also allows you to set up a list of favorite contacts. Once this list is created (spouse, close friends, dispatcher, chief pilot, etc.), go to the Settings tab in the app and turn on the "Always Notify Favorites" feature.



AirText

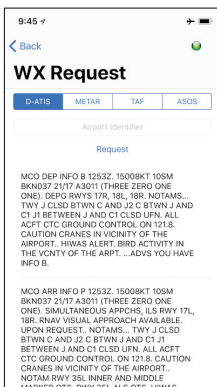
- AirText LT is portable and allows up to 6 connections
- AirText is STC'd and allows up to 16 connections
- AirText+ model also adds phone capability

AirText LT	6636A	\$4,950.00
AirText	20112A	\$9,750.00
AirText+	20190A	\$14,950.00

This will automatically send a message to your favorites when your airplane takes off, advising them to use your AirText phone number. A similar message is sent when you land. This is a great reminder, and the process is well thought out.

Weather request

Beyond text messaging, AirText offers a few other features that work within the confines of Iridium's low bandwidth. One is the WX Request feature, which allows pilots to get METARs and TAFs for any airport in the world. While this may not be a major help for US pilots (where ADS-B and SiriusXM weather receivers are common), it's a nice benefit for pilots outside the US. Want an updated METAR for Iceland when you're over the North Atlantic? Simply type in the four letter identifier for the airport.



FBO Link

A relatively new feature also allows AirText users to contact FBOs while in flight. This is a useful way to alert your destination FBO of your ETA, and make any requests for services. So far FBO Link is only available at a handful of airports, but it's an intriguing concept to watch.



Phone calls

The AirText+ unit enables voice calling in addition to text messages. This works by holding your mobile phone to your ear, but a better option is to pair the AirText with your headset or audio panel. To do this, go to the Keypad tab in the app, then tap the headset icon in the lower right corner. Now you'll be able to talk while using the noise-canceling benefits of your headset.

Data plans

Data plans cost \$300/year, which includes 1000 text messages. Beyond that, messages cost five cents each. Voice calls on the AirText+ cost \$1.60/minute, and use a prepaid Iridium sim card so there is no fixed monthly cost.

FLYING WITH THE INREACH SATELLITE MESSENGER

For pilots who don't need all the features of AirText, Garmin's inReach offers a portable and affordable way to stay connected in flight. We tested the inReach Explorer+ on 10 different flights recently, and found a lot to like. It certainly doesn't enable email or web browsing, but it is useful for short text messages, flight tracking and even emergency messages. It also integrates nicely with the Garmin Pilot app.

Getting connected

The inReach communicators are battery-powered, standalone devices that connect to the Iridium satellite network. That means they get reception everywhere in the world, from pole to pole, even at altitude. You can send position reports, type text messages, or check weather reports using the screen and buttons on the device. This actually worked better than we expected – it is time-consuming to type a long message with arrow keys instead of a full QWERTY keyboard, but it wasn't bad.

There's also an SOS mode that sends an emergency message to a global monitoring center, which can be activated by pressing a protected button on the side. This makes it useful as a standalone product.

The best option, though, is to connect the inReach to your iPad or iPhone via Bluetooth and use an app to manage communications. By doing this, you can mount the inReach in an optimal position for satellite reception and use an existing mobile device as the keyboard.

Garmin Pilot integration

One of the best features of the inReach is the way it can integrate into Garmin Connex, the company's vision for a connected cockpit. Once it's paired with your device, open the Garmin Pilot app and go to the Connex page. Here you'll see a green bar next to inReach, and you can tap on this page for basic information about



your device. You'll also notice a new menu option: Calls / Msgs. Tapping on this new menu option brings up the messaging page, which is the place to send and receive text messages. The app can also access your stored contacts, saving you time when creating a new message thread.

This worked quite well for us, but there are two limitations to be aware of. First, the inReach is particular about placement. You simply can't place the device on the floor and expect to get reception – it needs a fairly unobstructed view of the sky.

Secondly, the messages are not sent instantaneously. Sending a message took anywhere from 10 seconds to 60 seconds, depending on satellite location and reception. This isn't a major issue on a long flight, but it's something to be aware of if you're used to lightning fast messages on your smartphone.

The inReach does require a subscription. Plans range from \$11.95/month to \$99.95/month, with flexible options for both seasonal and year-round plans.

Garmin InReach

The inReach Mini features a black and white screen with fewer buttons; measures 3.9" x 2" and weighs 3.5 oz. The inReach Explorer+ provides full-fledged GPS on-map guidance with preloaded TOPO mapping; measures 6.5" x 2.7" and weighs 7.5 oz.

Garmin inReach Mini 6646A \$349.99 Garmin inReach Explorer+ 7969A \$449.99

USE IPAD AUDIO TO MAKE YOUR FLYING SAFER

The iPad is an engaging visual tool, but many pilots forget about its many audio uses. Especially for those pilots who worry about spending too much “heads-down” time with the iPad, it’s worth understanding how apps use audio to make flying more efficient and safe. Let’s look at some of the options, and how to set up an audio connection to your headset.

ForeFlight is able to display a number of pop-up alerts to provide you with time-sensitive, location-based information. These alerts include runway proximity, traffic, cabin altitude, destination weather, terrain, TFRs, final approach runway and low altitude (see the Settings menu on the More tab). There’s even an alert for weight and balance when your center of gravity is out of limits. What many pilots may not realize though, is that ForeFlight also provides audio alerts with these notifications.

Garmin Pilot doesn’t have quite as many audio notifications, but there is an option for helpful traffic alerts when connected to one of their ADS-B receivers. **WingX** provides helpful runway advisories via audio, as well.

Besides the big EFB apps, there is another audio app worth trying. The **Stratus Horizon** app offers a variety of features, including Stratus ADS-B receiver configuration and backup AHRS display. When connected to your iPad using the new Stratus audio cable, it can also record all your cockpit and ATC audio, allowing quick internal playback of ATC instructions. This is great during flight training to debrief your lesson and radio calls, or to quickly review an ATC clearance without having to say “say again”.

Another audio-centric app called **MiraCheck** recently hit the app store and brings a high-tech audio checklist to the iPad. By integrating voice controls and voice recognition, it provides a heads-up and hands-free way to run normal and emergency checklists in flight, turning your iPad into a virtual copilot.

Aviation headset manufacturers have also started offering their own apps. **The Bose Connect** app offers a number of options for fine-tuning your ProFlight headset (but not the A20), and it even allows you to pair two ProFlights to one iPad. **Lightspeed’s FlightLink** app goes further, by recording all cockpit audio and making it available for instant replay. There’s also a handy place to copy clearances or ATIS information.

All of these alerts and audio-based apps are a real benefit for pilots – no matter what you’re doing or what screen the app is on, you get important notifications when you need them. What can be problematic, though, is that the sounds coming from the iPad’s small speaker are typically drowned out by your airplane’s engine noise.

Fortunately, most modern aviation headsets

have audio inputs allowing you to route audio alerts directly into them to help get your attention. If you have a headset that offers Bluetooth audio compatibility, like the Bose A20, all Lightspeed headsets, or the David Clark Pro-X/One-X, you can wirelessly connect it to your iPad. Passengers love this feature for music, but it’s valuable for pilots too.

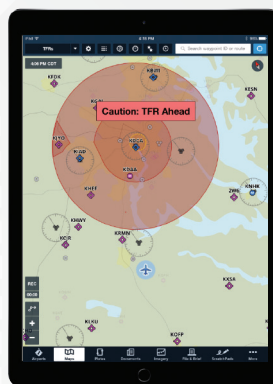
To do this, first activate the Bluetooth pairing function on the control module (usually using the button with the Bluetooth “B” symbol on it), and you’ll see a status light flash on the headset control module.

Next, go to the Settings app on your iPad, select Bluetooth from the list at the top left, and set the switch to on. You’ll soon see the name of your headset in the devices

list—tap it, and your headset will “pair” with your iPad and establish the wireless connection. The term pair here is important because you can only connect one headset to your iPad at a time. Now all the audio that you would normally hear through the iPad speaker will play through your headset.

You still have options if your headset is lacking a Bluetooth

music interface. Many still feature an auxiliary audio input that allows you to connect an audio cable to the headphone jack on your iPad, like the line of Faro Stealth headsets.



The ForeFlight TFR advisor feature provides audio alerts when approaching a TFR.



Lightspeed’s FlightLink app offers a number of helpful audio features.

BLUETOOTH HEADSETS

perfect for the iPad

BOSE

A20

At just 12 oz., the A20 is one of the lightest headsets on the market; combine that with its soft sheepskin ear cushions and minimal clamping force and you can wear this headset all day. Bose's proprietary active noise reduction cancels an impressive amount of engine and propeller noise, but maintains outstanding battery life.

A20 with Bluetooth

(specify PJ, LEMO, Helicopter)

3490A \$1095.95

A20 without Bluetooth

(specify PJ, LEMO, Helicopter)

9630A \$995.95



ProFlight

Now professional pilots can wear a Bose headset designed specifically for airline and corporate flight decks, including all the noise reduction, comfort, and advanced audio features that have made Bose the top-selling headset brand in aviation. The completely new ProFlight Aviation Headset weighs just 4.9 ounces and uses comfortable silicone eartips to virtually eliminate side pressure, so it can be worn for hours without discomfort.

ProFlight (specify PJ, LEMO, or XLR plugs)

9784A \$995.95



LIGHTSPEED

Zulu 3

The Lightspeed Zulu headset has been a pilot favorite for years, offering an unbeatable mix of performance and value. Whether you're flying a two-seat trainer or a large turboprop, Zulu delivers outstanding ANR performance and industry-leading Bluetooth options—all at a price under \$900.

3898A \$850.00



Sierra

The perfect choice for budget-conscious pilots, students, and passengers, Sierra offers high-end performance and features—including outstanding noise cancellation, full Bluetooth integration and compatibility with FlightLink, Lightspeed's in-cockpit recording app. Clear audio is enhanced by Lightspeed's outstanding active noise reduction that reduces low frequency noise.

2472A \$650.00



DAVID CLARK

ONE-X

The DC ONE-X headsets provide advanced comfort and technology features in a sleek, low profile design. You'll have the sound performance and durability you need, with the comfort you demand. Features Bluetooth® technology for inflight calls and music. The full size leatherette ear seals provide maximum comfort for long flights.

DC ONE-X (twin plugs)

8408A \$895.00

DC ONE-XP (LEMO)

7182A \$895.00



PRO-X

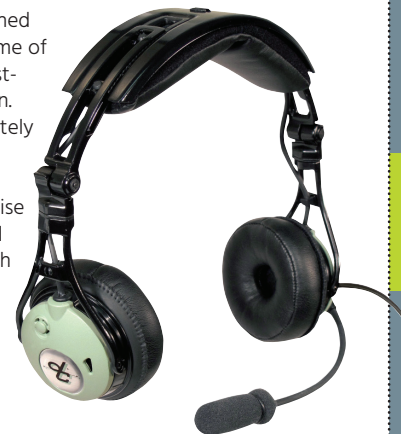
David Clark has a well-earned reputation for building some of the highest quality, longest-lasting headsets in aviation. The DC PRO-X is a completely new design with ultra-lightweight construction and superior electronic noise reduction. Includes: Hybrid ENC Technology, Bluetooth wireless input and soft, leatherette ear seals.

DC PRO-X (twin plug)

7359A \$695.00

DC PRO-XP (LEMO)

3434A \$735.00





ERIC RADTKE

ATP, Flight Instructor

PRESIDENT

Sporty's Academy

SPORTY'S PILOT TRAINING APP CONTINUES TO ADD NEW FEATURES AND NEW COURSES

The updates continue to roll out for Sporty's Pilot Training app, aviation's top resource for flight training courses on iPhone, iPad, Apple TV and Android devices. The latest updates deliver new study features, new avionics training courses and support for the new iPad Pro 11" and 12.9" models. There's even a Roku option now. Here are the details.

New courses

The Pilot Training app includes a wide range of training courses, from Private and Instrument training, to communications instruction and helicopter flying. The latest version adds two new avionics training courses, the 2019 Garmin G1000 Checkout Course and Flying the Aspen Evolution.

The new Garmin G1000 training course includes over two hours of all new HD video, showing how to master the system for VFR and IFR flying in Cessna and Cirrus airplanes. There's also a final review quiz, a training syllabus, and the official Garmin cockpit reference guide.

The Flying the Aspen Evolution course provides in-depth training on flying with Aspen's PFD and MFD retrofit avionics system. Lastly, the Flying with ForeFlight course was updated with new video training segments to show the app's latest features in action, like pre-departure clearances (PDC), SID/STAR procedure shortcuts, 3D Airport View, and runway final approach alerts. In addition to accessing any of the 13 courses in the Pilot Training app, you can also access each using web browser on a computer or from the dedicated Apple TV app.

iOS app gets smarter

One of the unique features in the iPad and iPhone versions of the course is that you can save videos to your device for later offline viewing when an internet connection isn't available. The latest update adds a new smart download manager feature, allowing

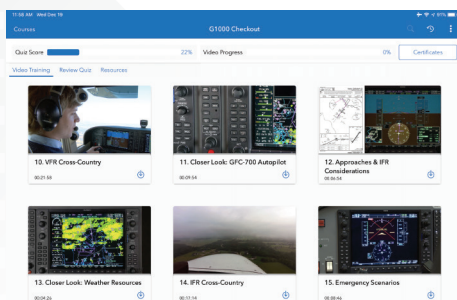
you to efficiently download a large selection of videos while continuing to use other features in the app. It also stores partial download progress, allowing you to resume downloading a large video file at a later time if you the process gets interrupted.

Another new feature to check out is the Video Search function, available in the Learn to Fly and Instrument Rating courses in the app. This is accessed from a new Search icon at the top right of the screen. Want to learn more about takeoffs? Simply type that in and the app displays a weighted list of all the video segments related to that topic. It's great for final check ride preparation, to quickly find training on topics you want to review.

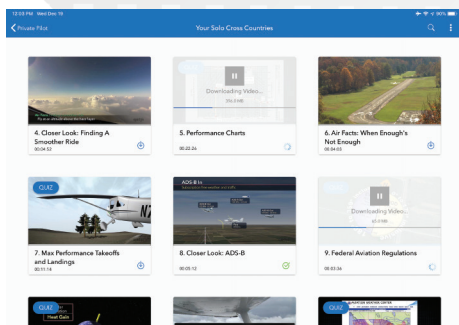
There are also some nice additions in the FAA test prep component of the app. This is a great place to prepare for the knowledge test, allowing you study representative FAA questions and view detailed explanations for both the correct and incorrect answer choices. New this year is the addition of interactive question references, which are displayed for every answer.

In addition to seeing the FAA resource in which the question is based, you can click on each of these to go right to the respective chapter, FAR or AIM location and learn more about the topic. It's a great way to turn test preparation into a meaningful learning experience, instead of just rote memorization.

In the Learning History section of the app, you'll now see which categories were selected for each test prep study session. This makes easier to identify the



topics covered in completed sections for additional review at a later time.



And for those who like to kick back and binge watch aviation training content, there's a new option in the main app settings that will set start the next video automatically after the current one finishes, providing an extended viewing option.

FAA test prep comes to Android



While the iPad dominates the tablet space in aviation, many pilots prefer Android for their everyday phone. The latest Android phones are pretty impressive and we see more and more pilots switching over from iPhone. Fortunately, Sporty's released a brand new Pilot Training app for Android with these pilots in mind, which is automatically included with each course purchase.

The latest update to the app adds a new FAA test prep component to the Learn to Fly Course and Instrument Rating Course. Students can select categories of questions to create custom study sessions, and get instant feedback after selecting an answer on why it is correct or incorrect.

As you continue to prepare for the knowledge test, you can take simulated 60-question FAA practice tests to make sure you're ready for the real thing. All practice

test results sync automatically with the included online and iOS versions of the courses, allowing you to request and earn your knowledge test endorsement immediately after completing all the video training and scoring 80% or higher on two practice tests.

New Roku channel

Since the heart of Sporty's courses is the HD video segments, it makes sense that the Pilot Training app is also available for Apple TV. That has proven to be a popular option (included free with the purchase of any course), so Sporty's has now extended the smart TV support to Roku. For pilots with a Roku-enabled TV, simply add the Sporty's Pilot Training channel and sign in with your sportys.com account. This will provide access to all your training courses, and once again all video progress syncs across devices.

Updates to the online course too

Along with the updates to the specific apps, Sporty's also added lots of new features to the online version of the 2019 Learn to Fly and Instrument Rating Course:

- **Video Search:** quickly find a specific video segment based on a keyword
- **All new FAA Test Prep:** a new, faster test prep module features 3 new study modes: Smart Study, Marked Question Study and Incorrectly Answered Questions study
- **Test Prep Analytics:** see detailed reports on past performance in each category of question
- **Test Prep Answer References:** each question includes a link to view the specific FAA reference book or resource from which the question is based
- **CFI Progress Sharing:** this feature was enhanced to allow you to share the specific video segments you've completed, and how you answered each question on practice tests
- **CloudAhoj Integration:** Connect your CloudAhoj account to view an analysis of the maneuvers completed on each flight, with links to view the corresponding flight training video segment from the course

- **FAA Handbooks:** quick access to all the FAA handbooks and reference guides

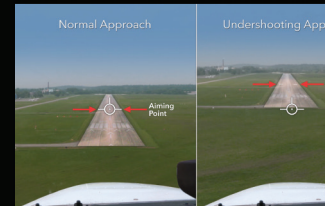


SPORTY'S PILOT TRAINING APP

Sporty's all-new Pilot Training app brings a variety of aviation training courses to one location, allowing you to access all your aviation content from your phone or tablet. It's free to get started - including interactive FAA practice tests and HD training videos.



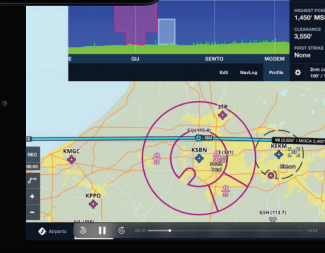
2019 Learn To Fly Course



2019 Instrument Rating Course



Flying With ForeFlight Course



Garmin G1000 Checkout

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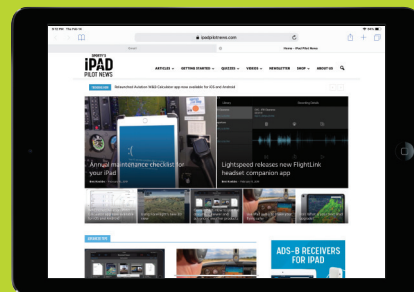
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Flight Gear Battery Pack This battery packs some serious power, 20,000mAh of capacity to be exact, and two 3 amp USB ports deliver enough power to charge multiple iPads at the same time while those iPads are being used by the pilots. A total of four USB ports are available to charge your devices: three standard USB-A ports (like those found on computers and wall chargers) and one USB-C output port.

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