Aviation apps

New features add utility to ubiquitous mobile devices

by Matt Thurber

n just half a decade since Apple introduced the iPad in 2010, tablet computers have become essential pilot tools, and it's rare to see a pilot flying today dragging around a heavy bag of printed charts. From basic chart replacement apps to fullfledged electronic flight bag (EFB) and performance apps, the tablet computer-whether running Apple's iOS, Google's Android or Microsoft's Windows operating system-has found a permanent home in every type of aircraft, from helicopters to light general aviation airplanes, business turboprops and jets and even the largest airliners.

The aviation app environment is maturing, and now we're seeing incremental improvements in many popular apps, rather than major developments. One area where there has been a leap in capability, however, is the adoption by many app developers of vector-based mapping engines. This isn't a new development-Jeppesen's maps have long used this feature, as has Garmin Pilot-but ForeFlight and Aerovie have now adopted vector-based maps, and we expect this will spawn new features and also be the default for EFB apps

EFB Apps



Aerovie (iOS; IFR \$69.99/year) Aerovie continues

adding features that set it apart from many other EFB apps, and it offers more Apple Watch functionality than any other aviation app. The AeroVector vector-based mapping engine allows Aerovie 4.5 to zoom right into an airport's taxi diagram, so users no longer have to pull up a separate taxi diagram for ground operations.

Aerovie's vertical profile is one of the most detailed available and shows depictions of cloud cover as well as clearly marked airmets, sigmets, icing forecasts and freezing level.

A feature that only Aerovie offers is a quick pilot report button, which allows pilots to submit a pirep directly to Leidos (formerly Lockheed Martin) Flight Service via in-flight connectivity systems.

Aerovie's Apple Watch functions provide multiple timers (flight, engine start, takeoff), airport thumbnail with frequencies and runway information, automated landing



briefing and checklists, and weather information.

Aerovie also has synthetic vision. The latest version adds a new runway sunset and sunrise awareness feature, which alerts users when conditions might be right for distracting glare during landing. Aerovie's barometric altimeter (available on later-model iPhones and iPads with a baro sensor) can pull information via ADS-B IN receivers and display barometric pressure altitude based on local conditions.



ForeFlight remains a top-selling EFB app in the business aviation market, and the company makes it easy for flight operations to add iPad-based EFBs, with a full suite of compliance-management and regulatory approval services, as well as JetFuelX fuel importing from many fuel vendors. In addition to ForeFlight's data-driven vector-based mapping engine, released last year, the company is developing a flightplanning engine with turbine aircraft profiles that provide much more accurate flight time and fuel burn numbers.

ForeFlight's graphical weather briefing tool walks a user through a detailed briefing in an easily interpreted format. ForeFlight also offers webbased flight planning, which can be shared with the iPad version; the weather briefing is available on ForeFlight web as well.

Synthetic vision and a vertical profile are longtime Fore-Flight features (although the vertical profile doesn't depict



weather). ForeFlight offers pilot logbook, weight-andbalance, integration with the Appareo Stratus 1S and 2S ADS-B IN receivers and ESG ADS-B OUT transponder and SiriusXM weather when using the SiriusXM Sxar1 portable aviation weather receiver.



which runs on various mobile devices, remains one of the most powerful free EFB apps



available. It has moving map with geo-referenced approach charts, route fuel prices, inflight weather via ADS-B IN or SiriusXM Sxar1 weather receiver, weight-and-balance, logbook, pre-departure clearances and checklists. FltPlan Go is fully integrated with the FltPlan web-based flight-planning service (also free).

A feature added last year to FltPlan Go is split screen, which can display six-pack flight instruments, airport information (such as procedures), navlogs, checklists, weather, scratchpad and other FltPlan tools.



(iOS; IFR \$139/year) The Seattle Avionics FlyO EFB app makes extensive use of split

screen, with many features avail-



able on either screen, among them highway-in-the-sky navigation, synthetic vision, wind shown in an easy-to-understand graphical format, airport surface wind depiction and scratchpad. In addition to all the now-standard EFB features, FlyQoffersaerialphotoviewsasa map layer.



Version 8.5 of Garmin Pilot for iOS adds integrated weight-and-balance, new performance tables, freehand flight plan editing and aircraftspecific checklists that can be modified by the user.

In addition to assessing aircraft loading, the weightand-balance calculator is incorporated into flight plans or saved trips, according to Garmin, "taking into account fuel burn and more for a comprehensive look at weight-and-balance characteristics through an entire flight." The calculator shows



the change in loading with fuel burn during the flight, and the integration allows the user to select various fuel loadings that depend on the payload, such as maximum fuel and 30-, 45- and 60-minute reserve. Performance information, including weightand-balance data, for various piston aircraft is already baked into Pilot.

When planning a flight, pilots can adjust the power setting and altitude (from a list of altitudes and forecast winds and temperatures aloft) and instantly see the effects on cruise speed and fuel burn. While flying, if it is necessary to recalculate a route around weather, obstacles or airspace restrictions, the pilot can finger swipe a new route on the moving map using the new Freehand feature. Freehand

doesn't create new user waypoints but adjusts the route using nearby navaids, intersections and airports and adds them to the flight plan. The pre-populated aircraft in Garmin Pilot 8.5 have interactive checklists.

Some of these features are not available in the Android version of Garmin Pilot.



1\$139.99/year) The iFlightPlanner system is focused primarily on webbased flight planning using

browsers running on any type



of device, and it is integrated with the iFlightPlanner iPad app. The flight planning system provides weight-and-balance, pilot logbook, moving map with flight data recorder, digital instrument panel and instrument approach timer, cockpit voice recorder and split-screen view.



Flitedeck Pro (iOS, Windows; price based on data subscription)

Jeppesen

Subscribers to Jeppesen aeronautical data can use a key code to supply that data to the company's Mobile Flitedeck Pro app, one of the very few that runs on both iOS and Windows devices. Jeppesen has also made its data available (for Jeppesen subscribers only) to other EFB

apps such as Garmin Pilot.

Flitedeck Pro was designed for display of vector-based IFR charts (there is a VFR version as well as a VFR en route laver for the IFR version). But now Flitedeck offers flight-planning features as well as the ability to import flight plans from RocketRoute. Weather information is available, as are recently issued cleared routes. Flitedeck shows own-ship position on both en route displays and terminal charts. In December, Jeppesen began releasing improved SID and Star charts with depictions of terrain, color to show important features and true-to-scale chart elements.



WingX Pro7 (iOS, Android: IFR \$149.98/year)

Hilton Software has a long history of delivering moving-map functionality on early mobile devices, and its latest version, WingX Pro7, pioneered many of the features that pilots have come to expect as standard in mobile EFB



apps: synthetic vision with attitude driven by an external AHRS, vertical situation display, split screen, heightabove-terrain/agl, and the ability to draw a route or diversion on the screen for addition to a flight plan. WingX Pro7 also was the first EFB app where pilots could add a SID or Star and instrument approach procedure to a flight plan.

OEM/Training Apps

More avionics manufacturers are using mobile device apps for training and to deliver manuals and performance information to

customers. Tablet computers are well suited to this purpose, especially for avionics that are touchscreen controlled, and one of the big benefits of providing training modules on tablets is that a prospective customer can learn all about a product's functionality and performance before buying.



Avidyne IFD (iOS; free)

free

Avidyne's

IFD iPad app is a great way to preview the IFD 440/540 com navigators before buying, and then learn how to use them



before taking off in the airplane. The IFD simulator provides live weather information, and two versions of the app are available, one for the U.S. and another with an international database.



Aviation Applications Aspen E1000 (iPad; \$11.99)

This just-released avionics trainer replicates the Aspen Evolution EFD 1000 display, although it doesn't have synthetic vision and some functions are not usable. It is to be hoped that the developer will add capability in future versions.



available from

FlightSafety)

FlightSafetyInternational'snew datalink training module for the Gulfstream G450 and G550 is available on the FlightSafety FlightBag app as an iFlight-Deck operational-use trainer, replicating the exact steps needed to fly from London to New York. The program covers digital ATIS, logging on in London, takeoff and departure, requesting altitude and speed changes, oceanic clearances, abnormal and emergency situations, weather deviations, free texting, digital clearance (DCL) and much more.

Pilots can run through the entire CPDLC course to learn how to use the new technology, or take a refresher before a trip. Each subject can be reviewed on its own so it isn't necessary to start at the beginning. For a refresher on digital clearances, for example, the user just clicks on the CPDLC-DCL section.



Within each subject, the training course moves the pilot step-by-step through the datalink process. The user has to select each FMS key to advance, and hints help prompt the right response. Using the app is just like the real thing, and it even provides aural alerts such as a two-chime when ATC responds.



Anyone looking at buying a Garmin GTN com navigator should download the free GTN Trainer app. It's easy to set up the Trainer in a specific location, altitude and airspeed then "fly" it just as if it were in a real aircraft. The touchscreen mimics



the GTN 650/750 interface, and the app comes with Safe-Taxi charts, FliteCharts, highresolution worldwide terrain and aviation databases, simulated ADS-B and SiriusXM weather interfaces, audio panel and transponder.



As part of its GoDirect line, Honeywell has ramped up app development efforts, drawing on the information it generates to deliver some useful apps for pilots. One of Honeywell's most useful apps is the free Pilot Gateway for access to manuals, service information letters and navigation alerts for all of its FMSs, avionics suites and satcom systems.

The Pilot Gateway is an excellent resource, with pilot's guides for all of the airplanes and helicopters for which Honeywell manufactures avionics and engines.



Flight Preview allows pilots to "pre-fly" instrument approach procedures (currently in the U.S. only, including Alaska and Hawaii) by viewing the approach from a cockpit perspective as flown over a terrestrial map.

The Weather Information Service app allows pilots to view forecast weather for a particular flight plan, both overlaid on a map of the planned flight and as a vertical situation display graphically illustrating location and altitude of cumulonimbus tops, forecast winds aloft, clear air turbulence, icing and sigmets.

While the Pilot Gateway is free, there are subscription fees for the Flight Preview and Weather Information Service apps.



Universal Avionics Touch CDU (iPad: free, but

requires Windows-based FMS desktop software)

Teaching a pilot unfamiliar with how a flight management system (FMS) works can be challenging without access to a physical FMS trainer or training software at the major simulator training providers. Universal Avionics has simplified the process somewhat with the Touch CDU iPad app, which works with the company's FMS desktop software. The iPad Touch CDU doubles as the control-display unit to operate the Windowsbased FMS, allowing the user to learn how to program the FMS without distraction in the comfort of home, instead of waiting for a training event or trying to learn while flying.

Performance Apps

Many aircraft manufacturers offer their own performance calculation apps, but independent companies such as APG, Cavu, Gyronimo and others have carved out their own niches with tablet-based performance apps.



IPreFlight (iOS; price varies by subscription)

The latest version of Aviation Performance Group's iPre-Flight app adds the Max Payload Estimator, which accounts for changes in loading during flight to help operators ensure



the aircraft remains within cg limitations from takeoff to touchdown. APG's runway analysis is widely used by business jet and airline operators to maximize payload at hot-and-high airports, by using APG's custom-designed engine-out procedures.

The weight-and-balance feature calculates reserve, alternate and holding fuel and forecast weather conditions for the planned trip.

Once the performance is determined, the user can save and send a flight release that shows the runway analysis, weight-and-balance, takeoff and landing distance, notams, flight plan and textual and graphical weather information.

iPreFlight now has a separate cold-weather operations app for determining adjustments to altitudes during instrument approach procedures when temperatures are colder than normal.

The user will be able to enter an airport ID and the temperature and quickly see the necessary adjustments without having to run the numbers in the FMS or calculate the restrictions separately, and this feature will work offline too.



(iOS; price varies by subscription) The EFB-Pro app calculates weight-and-balance and take-

weight-and-balance and takeoff performance using aircraft manufacturer flight manual data, which provides a "net takeoff flight path profile... used to calculate obstacle clearance weight restrictions," according to Cavu.

EFB-Pro can be used either online or offline, and takeoff and landing performance extends to wet and contaminated runway information when the aircraft manufacturer makes that available. EFB-Pro also offers assistance with fuel tankering and a holdover-time calculator for ground deicing.

Other Useful Apps

Tablet computers have generated a great deal of creativity among app developers, everything from new ways to look at weather to flight debriefing and oxygen/emergency management.



AirDB (iOS; \$19.99/year) Slobodan Vuckovic's AirDB is

a comprehensive database of business airplanes and helicopters that makes comparing performance specs simple



and easy. Range ring maps for different models can be overlaid for a quick comparison of range capability. The business aircraft database covers pistons, turboprops and jets.

Newly added information: operating cost per flight hour, cabin volume, payload with full fuel and sea-level cabin altitude.

The helicopter database, sold separately but also \$19.99/year, covers civil piston and turboshaft rotorcraft.



dard \$45/year) CloudAhoy remains the gold standard for post-flight debriefing using just recorded GPS data to analyze flight track information, although with additional data the service can provide even better resolution.



CloudAhoy is both a service available on the web and an iOS app for recording flight data, but debriefings can be done using data from GPX, MKL and IGC files, ForeFlight Mobile, portable GPSs and avionics such as GRT, Dynon and Garmin G1000 and G3X products.

Once the flight data is uploaded to the CloudAhoy server, the user can review flights in 2- or 3-D, as a cockpit view, alongside video of the flight and overlaid with charts and instrument approach procedures.



Ergo 360 (iOS; price varies by subscription) The Aeronauti-

cal Data Systems (ADS) Ergo 360 app allows pilots and flight planners to maximize the benefits of onboard oxygen supplies to minimize the amount of fuel that must be carried. The original Ergo 360 presentation shows two range circles on a map with the aircraft's own position and planned diversion



airports. One circle shows the airplane's fuel range (blue), and the other (green) is the airplane's oxygen range during an emergency diversion. If something happens that means the airplane can't reach an airport, such as an engine failure after decompression over the ocean, the flight crew might have to

plan to ditch. The newest version of Ergo 360 adds a vessels tab that shows the location of ships in case a dire emergency requires a water landing. The vessels tab pulls up a near real-time display of all ships that participate in the Automatic Identification System (AIS) vessel-tracking service. Touching any blue vessel symbol pulls up speed, ship type and track.



wx24 pilot (iOS; \$15.99/year) Pilot Paxton

Calvanese never liked the way weather information was disseminated and finally decided to do something about it. The result is the wx24 pilot app, which graphically depicts aviation weather and allows pilots to set go/ no-go parameters to help with decision making.

What differentiates wx24 from other weather and EFB apps is its generous use of a graphical display of metars, TAFs, airmets, sigmets and TFRs. The graphical display is a 24-hour circle that color codes the weather and shows elements that might affect the flight; the circle can be set to a 24-, 12- or one-hour period, with an airplane symbol showing the current time so the user can instantly see the effect of upcoming weather.

Users can view the graphical weather for local airports or for an entire route. While the graphical interface is easy to interpret, it does take a little time to learn, and Calvanese urges new users to look at the wx24 screen shots, videos and tutorials.