

# Electronic Flight Bags:

## Helping Pilots Avoid

## Common EFB Traps



STORY BY DAVE HIGDON

**A**s a group, pilots tend to love gadgets. All sorts of gadgets – particularly gadgets with an aviation bent that improves something.

For example, many pilots quickly jumped into the electronic E6-B flight computer. Yes, the old analog circular slide still worked, but the electronic models quickened calculations.

Ditto for the hand-held GPS navigators; and this category caught on like a prairie wildfire.

One of today's newest digital gadgets, the so-called "tablet" computer, is popularizing a growing pilot favorite: the electronic flight bag, or EFB – and to a greater degree than previously seen.

Already popular as a purpose-made system of hardware and software, the advent of these tablet devices and EFB software is driving a fresh new wave of interest and buying.

The pilot simply acquires an iPad, Droid-based tablet or electronic book reader and buys and loads the appropriate software. As quickly as the device loads and launches, it becomes an EFB.

This fresh wave of EFB appeal washes beyond do-it-yourself solu-

tions, driving more pilots to consider the purpose-built, factory-created EFBs. Many arrive ready to work, delivering charts, plates and procedures, while also providing GPS-driven geo-referencing graphics.

According to officials from Jeppesen, the company's use of paper last year dropped to 1 billion pieces, down from 4 billion at the turn of the century due to the increasing embrace of electronic charting.

The EFB can, in one fell swoop, obviate the need for a portable GPS back-up navigator, an E6B flight computer and the heavyweight vestige of aviation's first century: paper manuals, company operational documents, aircraft-specific checklists and the signature leather chart case accessory of the working aviator.

Sadly, as quickly as pilots made the shift, safety officials began seeing reports of safety incidents, occurring partly because of the pilot's fixation on an EFB.

We've seen this before – and not all that long ago – where a technological device contributed to safety issues.

At the dawn of the handheld GPS navigators in the early 90s, too many pilots jumped right in to entering the point of origin, destination and pushing the button to go “direct.” And, as they spent more time steering by the image on the screen, working to stay on the course line, too many pilots began to break good habits, such as flying VFR by watching charts and the ground to steer clear of places they shouldn't be.

The same things occurred when panel-mounted GPS navigators began to proliferate. With integrated cockpits, pilots became fixated on using an unfamiliar device to the exclusion of an aviator's prime directive: fly the plane.

According to a host of reports gathered over the past several years, an EFB factors into a growing number of reports of pilots doing the aerial equivalent of stumbling around the sky while trying to work a new, unfamiliar EFB.

Manufacturers and software creators offer help to obviate the unfamiliarity issue.

Training software, websites and tutorials can play a role in making new EFB customers both happy and safe in the sky.

But, use of these learning tools depends on the incentive

and survival instincts of the customer – and their awareness of the existence of training aids. Reading manuals isn't always the first instinct of new product owners.


Dealers, shop owners and vendors are, however, in a position to help and contribute to safer skies through smart customers eager to avoid becoming a future safety statistic.

### **The EFB: Clearing Some Confusion**

The basic electronic flight bag represents an advantageous technology.

Advantages extend beyond the obvious: eliminating thousands of pieces of paper and managing updates.

The serious aviator diligently tracks and files chart, plate and procedure updates as they come in – every 28 days; 13 times a year.



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One-click update management is one of the more-significant gains of a well-executed EFB – beyond the paper reduction.

A capable EFB also may host other pulp-based cockpit flotsam, such as the aircraft flight manual, pilot operating handbook and facilities directories. And, all are searchable.

Moving beyond the document tools, EFBs may offer operational tools such as graphical weight-and-balance calculators, flight-planning tools and live weather service with both text- and graphics-based tools – imagine graphical METAR, SigMet or AirMet charts, and near-live digital-Doppler weather radar graphics from various sources.

These functions all fit into the memory chips of a com-

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pact electronic device with a large display screen – 6 inches diagonal and more – but less than an inch thick and weighing less than a single volume of approach plates.

EFBs can be – and generally are – independent devices. But, some EFBs also are part of the equipment on the flight deck of modern business jets and airliners.

Coveted for its functionality, even the simplest documents-only EFB demands a degree of familiarization and user competence to be used safely in flight.

### **Stating the Problem: Insufficient EFB Pre-Flight Preparation**

In-cockpit EFB training entangles unfamiliar pilots in many ways.

According to reports submitted to NASA's Aviation Safety Reporting Service, the dominant issue is using the charting functions, with infractions ranging from busting an altitude restriction, straying off heading, failing to observe a speed or other clearance instruction.

Many pilots cited the primary factor difficulties operating a Class 1 EFB.

One issue troubled both air-carrier crew and general aviation pilots: controlling the image and seeing what they needed.

Pilots reported struggling with the need to pan, scroll or scale (zoom) pages to view all the relevant information from an approach plate, arrival or departure procedure.

Other incidents arose from pilots struggling to go from one displayed graphic to a different document – something routinely needed when controllers alter flight plans, issue new clearances or during a missed-approach transition.

But, some pilots didn't get airborne before experiencing an issue, with runway incursions and taxi incidents among the reports, because the pilot was head-down struggling to use the EFB while moving.

It doesn't matter which class of EFB is used or at what level the pilot practices. Insufficient preparation and inappropriate focus on an EFB occurred at all levels.

The Volpe National Transportation Systems Center looked at ASRS reports involving EFBs between 2000 and 2009. In its April 2010 report, "Review of Safety Reports Involving Electronic Flight Bags," it offered this breakdown of the 63 incidents it found:

- 32 incidents involved charting functions.
- 27 incidents related to position or data calculations for EFBs with GPS – two involving documents, one involving charts and documents, and one of unspecified origin.

- Part 91 pilots experienced 24 of the chart-related problems.
- Part 121 operations saw three incidents, 135 operations five.
- All of the problems related to EFB calculations originated with 121 pilots.

Actual accidents were rare per NTSB data, with two making the list.

One accident occurred July 31, 1997, the landing crash of a FedEx MD-11 at Newark, N.J. – in day, VMC conditions. The second came on Dec. 8, 2005, when a Southwest 737-700 overran its runway during a landing at Chicago Midway Airport.

Appropriate preparation and familiarization can help a fresh EFB convert avoid becoming one of those incidents reported to the ASRS.

### **Learn Before Getting Burned**

According to the experts, practice using the EFB – while not flying. This is the best path to avoid the need for an ASRS report.

Dealers and shops can encourage this practice.

"We advise the same for pilots moving to glass cockpits or FMS-like GPS navigators," said Bruce Landsberg, head of the AOPA Foundation's Air Safety Institute. "The time and place to learn to use this kind of electronic equipment is on the ground. That applies to the EFB."

This means simply keeping a new EFB out of the cockpit until the pilot is comfortable and competent in its use.

And, according to Roger Dykman, director of general aviation for Honeywell Aerospace, maker of the AV8OR line of EFBs, "The cockpit environment should not be used for systems training by the pilot-in-command."

Instructors working for several large pilot-training centers and a number of FAR 135 charter pilots repeated the message to their fellow aviators: Don't tackle using any new EFB device of any kind until competent at using the EFB on the ground.

"The key to safe operations lies in thoughtfully integrating them into flight operations with the same level of care as one would use for newly certified avionics," Dykman said.

Landsberg noted that one challenge of using an EFB stems from how it presents itself for use through its interface.

"In terms of the interfaces and other uses, if we tend to get deeply, regularly, into our devices when flying in high-density airspace, it can too often be to the detriment of the pilot flying the airplane," Landsberg said.

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Interestingly, pilots who reported their problems generally had access to training and tutorials.

Avionics makers all point to the training options for their devices.

Garmin offers on-line training for the 696 and points to that site as the best place to start learning the device's many functions.

Honeywell's AV8OR hosts its own internal flight-simulator programs, allowing a pilot to learn, use and manage the device while "flying" a simulated trip entered into the flight-planning function between any two airports, IFR approach included.

A short cross country can introduce almost all the functions used for such a trip without leaving the house or hangar.

"This is an excellent opportunity for the pilot to configure the AV8OR to their personal preferences, including map de-cluttering settings that can reduce any potential for data overload in flight," Dykman said.

Jeppesen's new iPad-based and FX-tablet based products include tutorials and integral training to introduce all the relevant functions.

In the end, Dykman, Landsberg, officials from Jeppesen and instructors at flight-training organizations concurred: It's all about knowing how to use the software and how to move between functions.

Dealers and avionics shops can help nudge along their customers by stressing the availability of training tools and other familiarization steps, even if it means showing them how to start with a demo model.

## An EFB User Checklist

Every buyer should know to head anywhere but the cockpit to learn the use of these promising tools.

What basics should the user know before considering their first flight?

Safety investigators, CFIs, avionics executives and safety gurus offered these six items:

1. Power. EFB "On," EFB "Off." It sounds too fundamental, but since some devices default to an automatic shut down if not used for a while – a battery-saving feature or bug, depending on how hard it is to change – users should know the exact location of the power switch so they can find it in the dark.
2. Loading. The users' first step after power should be learning to locate, load and switch between needed charts and plates.
3. Zoom, scroll and pan. Mastering these three are the most-frequent problems cited by pilots in reports to ASRA.
4. Swapping functions. Getting chart use down opens the way to learning how to move between charts and other functions – weather, manuals or flight planning, for example.
5. Currency. Know when – and how – to update the charts. Users should do before real use to avoid using out-of-date data, since the device was made and loaded several cycles back.
6. Power plan. Encourage the user to run down the battery to learn how long it actually lasts – even when the ship's power option exists – and to allow a full recharge for maximum life.

A GPS-capable EFB could be a lifesaver after an electrical-system failure. □

## EFB Category Primer

*If the customer isn't sure what type of EFB he or she needs, you can help them understand the class confusion with this primer.*

*EFBs, per FAA Advisory Circular AC120-76A, belong to one of these three classes.*

*Class 1 EFB is a simple portable document reader with no connection to the airplane or its systems. FAA certification is generally not required. It also can host*

*other functions, such as GPS navigation.*

*Class 2 EFB is portable devices that are connected to an aircraft mounting device during normal operations and must be approved for their use in that aircraft. It can do all a Class 1 can do, plus any other functions designed into it and approved.*

*Class 3 EFBs are installed devices and require approval from the FAA for the hardware, software and installation. □*