Cockpit Portables:
Becoming an Informed Buyer

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When aircraft owners consider an avionics upgrade, they usually think in terms of installing new panel- and/or remote-mounted equipment. That's as it should be: The reliability and accuracy of an FAA-approved avionics installation not only enhances an aircraft's utility, it can transform it from a local-only flier into a cross-country traveling machine, capable of dealing with most weather and airspace.

But expending the cash — and dealing with the downtime — sometimes involved in doing a panel upgrade isn't for everyone. Most pilots, in fact, aren't fortunate enough to be owners. For renters, borrowers and flying club members, ensuring they have the latest and greatest avionics is often a hit-or-miss proposition.

For these and other reasons, the goal of ensuring a pilot has the latest and greatest avionics in his or her cockpit often means buying a box that isn't installed only in one airplane — and that means choosing from among the growing market for portable avionics.

Given the depth and breadth of that market and specific needs — real or perceived — some renter pilots can face a daunting decision, one with the capacity to put a sizeable lump in a credit card statement. But some research, planning and investigation can go a long way toward making the purchase of portable avionics fairly painless. Let's see how.

Photo by Jeb Burnside

As this pairing of older and newer portable GPS navigators from Garmin shows, cockpit portables have come a long way in only a few short years. If you're considering a new cockpit portable, think about how you will use it, how you will mount it and how it might interfere with your No. 1 job: flying the airplane.

A Little History

There was a time not so long ago when a portable electronics product in an aircraft was unheard of — but as the microchip migrated down from space capsules to cockpits, manufacturers discovered they had to cram more capability into their newest boxes or lose market share.

With the ability to put more and smaller boxes in a panel and still have some useful load remaining, new products, such as audio panels, were invented, allowing pilots to manage their new toys better. Then came headsets, push-to-talk switches Velcro'd to a yoke and battery-powered intercoms — the first batch of cockpit portables worthy of the name.

Soon, these were followed by handheld communications radios useful for emergency situations and copying IFR clearances before engine start. And, without an external antenna, little else.

The market for cockpit portables really didn't heat up until the global positioning system (GPS) came on the scene. Since then, cockpit portables have taken off — literally and figuratively. In fact, about the only avionics products

for which a portable version doesn't exist today are those requiring a permanent connection to some aircraft system or component.

From there, however, only the sky's the limit. Need a moving map with almost-real-time weather data? No problem. How about a "metal detector" or collision-avoidance device? We can even throw in a back-up artificial horizon. Want to put most of this on your personal digital assistant (PDA), laptop or tablet computer? Just download the software, buy a GPS antenna and an interface box, and you're set. Or pick up a dedicated product usable in a car or on your boat.

We've come a long way indeed, and now can enjoy digital music of our choice — satellite or MP3 — as we dodge the red splotches on our Nexrad weather radar display and sip the Starbucks coffee we picked up at our last fuel stop. And that's a good thing, even though we still spend too much time determining the best place for all the wires.

Photo by Jeb Burnside

Some cockpit portables are based on consumer-grade hardware. This PDA-based early generation backup artificial horizon could be tempermental if its boot sequence was interrupted and its user interface wasn't optimized for cockpit use. Depending on what you want from a cockpit portable, choosing a product designed for aviation use from the beginning may be the best solution.

But with these choices can come confusion, accompanied by responsibility and, perhaps, some hard choices.

Decisions, Decisions

Once you've decided you need a little more help with your cockpit chores, a wide range of possibilities opens up. But there are some considerations to address before whipping out the credit card. Here are a few of them:

Power Supply

Many portable devices designed for use in the cockpit are battery-powered, especially those marketed for general consumers that happen to have an aviation application. But batteries run down, and you don't want to find yourself changing a batch of AA cells some dark and stormy night just to find your destination airport.

Even for aviation-dedicated portables, supplying ship's power — usually through a cigarette-lighter adapter — can be a reliability requirement. That's fine as far as it goes, but what if what you're flying doesn't have a working cigarette lighter? Or you need to power more than one cockpit portable? Or your aircraft uses a 28-volt system and the device you want to power is 12-volt only?

Most, but not all, made-for-aviation devices you'd want to carry likely are built to accommodate either 14- or 28-volt systems. Nevertheless, if you're confronted with an oddball device or are trying to use a 12-volt device in a 28-volt airplane, you may have to get a bit fancy.

Voltage step-down devices are relatively easy to come by; just check with an avionics supplier. Other solutions to some of these problems include carrying a spare battery pack or two; "hard-wiring" an outlet into the aircraft's electrical system (which likely will require a qualified technician); or getting a portable, battery-supplied power system exceeding your device's demands.

If you're lucky, and the only challenge you have is powering more than one cockpit portable, you easily can find a power outlet "splitter" from just about any aviation parts supply company.

Remember this, however: When the power cord is permanently wired into the aircraft electrical system, those wires now need to meet the same design standards as the rest of the aircraft wiring. For installation in type-certificated aircraft, the installation must meet the criterion of Part 43 of the Federal Aviation Regulations.

Mounting/Antennas

Another challenge is proper placement of the cockpit portable to maximize its utility. I once flew left-seat with a friend balancing a tablet computer, satellite-weather antenna and GPS receiver in his lap and on the glare shield for a 600-nm flight. The wiring alone presented cockpit management challenges.

Thankfully, we weren't depending on any of this to find our way home, since the combination never lived up to its promise. But if he hadn't been with me, I likely would have ended up with severe neck pain from continually glanc-

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ing at the passenger seat for enlightenment — or I would have simply shut it all off.

When considering where and how to mount a cockpit portable, make certain its display doesn't interfere with looking outside. The device's controls should be easily accessible but positioned where getting to them won't interfere with any other controls or switches in the cockpit. And it needs to be secure, not only when rummaging for a chart, but also when encountering turbulence or, especially in my case, during a "normal" landing.

Antenna placement can be another issue confronting someone wanting to use a cockpit portable depending on satellite reception or two-way communications. In the former, experimentation might be needed to find the best location given your aircraft's magnetic field, which can interfere with the signals you're trying to receive.

With a handheld communications radio, it's unlikely you'll get the best performance from the unit's built-in antenna. Instead, you should plan for your avionics shop to install a dedicated com antenna, or at least a remote jack for the handheld with a splitter allowing an existing com antenna to be used by connecting a cable.

There's also the issue of cockpit clutter. While cockpit organization is a highly personal taste, minimizing clutter certainly can become a safety issue, and a maze of wires supplying power, data signals and audio output, among others, easily can interfere with emergency egress in the event of an off-airport landing.

Once you get your cockpit portables installed and positioned as you want, take some extra time to secure all the cabling they require, preferably out of sight behind side panels or under the carpet.

The manufacturers of portable electronic devices usually deliver their products with a temporary yoke-mount-type attachment. However, should the mounting device be bolted into the aircraft structure (such as inside the panel or on top of the glare shield), it now must meet the same certification requirements as other mounted articles in that aircraft. Although the PED continues to be considered portable, once the mount is permanently attached to the aircraft, the mount is no longer portable and, for type-certificated aircraft, must be installed in compliance with Part 43 of the Federal Aviation Regulations.

Safety

One of the most important decisions you need to make has to do with safety: How will you use your cockpit portable?

More to the point, you won't use a handheld GPS, for example, to shoot an instrument approach in for-real conditions, will you? Don't laugh; it's happened — we know from the NTSB's post-crash investigations.

Many of today's portable GPS navigators can equal or exceed their panel-mounted brethren in accuracy, features and available aeronautical data. Since they also can come with terrain avoidance and published instrument approach databases, it's tempting to use them to fly an instrument approach when your panel isn't up to the task. Don't. Just because the data is there — and the unit "seems" accurate and reliable — it doesn't mean depending on a cockpit portable is a good idea, especially when the cockpit portable isn't designed for aviation use.

Similarly, satellite-delivered Nexrad radar data was something unheard of until a few years back. Pilots should think of these as strategic tools, not tactical ones. The difference is subtle, but real: Use the downloaded radar data to make big-picture diversion decisions, not to penetrate a line of thunderstorms spawned by a fast-moving cold front.

Finally, the advent of hyper-accurate navigation boxes coupled to autopilots sadly made finding some missing aircraft almost too easy for search-and-rescue personnel. In many instances, personnel looking for an overdue aircraft were able to plot a straight-line course between the departure and destination airports, then look on the chart for the highest terrain. Too often, they found the wreckage on the side of a mountain along the flight-planned route, on the centerline, at the cruising altitude.

The moral is, no matter how many high-end gadgets are in your cockpit — whether portable or panel-mounted — the basic airmanship rules still apply. There is no free lunch. You still have to fly the airplane safely and responsibly.

The Final Choice

With all of this in mind, it's now time to decide what you want your cockpit portable to do for you. With some products — handheld coms or traffic alert devices — the choice is relatively easy: Simply compare various products' features against their cost, then buy the one best suiting your needs.

But with some other prod-

ucts, the choice isn't so simple. For example, moving-map GPS navigators or electronic flight bags built to display digitized charts can be hard to choose. There basically are two ways to go when considering this type of cockpit portable: Buy a product mostly designed from the ground up for aviation, or use consumer hardware with custom software providing the desired functionality.

I'm fortunate to have experience with both kinds of products and, for me, the choice is easy: Get the aviation-dedicated cockpit portable.

You might be able to save a few dollars and use the basic product for other, more down-to-earth purposes when not airborne, but that's the only real benefit I see when considering a consumer-grade hardware solution for the cockpit. The bottom line is, the device isn't designed with your aviation needs in mind; instead, it's made to be all things to all people, and compromises have been struck.

Also, the task of making all the software and external devices, such as GPS antennas and Bluetooth transmitters, actually work and play well together in the cockpit can be extremely frustrating. All this usually comes at a time when you should be flying the airplane, not rebooting.

After you've spent hundreds, perhaps thousands, of your hard-earned dollars for something that's supposed to ease your cockpit workload only to find the effort has increased, you'll wonder why you didn't spend the few extra dollars to get the dedicated aviation product. And did I mention the wiring?

When considering cockpit portables, the bottom line for me is how well the product works in a busy cockpit, then gets out of the way. While they may be out there, I've yet to see a consumer-grade product in a cockpit that didn't bring with it some drawbacks. While some of them may still be present with an aviation-dedicated product, they are fewer and their operational impact isn't as great.

Your mileage may vary, though, and you may be the type who likes to work with your gadgets in the cockpit. I'd rather fly the plane, admire the scenery and get where I'm going safely and well informed. And aren't those the reasons you're considering a cockpit portable in the first place? ■