

The Connected Cockpit

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Is inflight internet access a **safety tool or a hazard?**

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When we bought our current airplane, just over 10 years ago, I had a decision to make that I'd never faced previously: Do we want access to the internet? Back then, the system of choice was expensive and slow, but since it would be useful for email and limited downloads, it was still worth considering. Interestingly, the passengers were strongly opposed. They regarded the airplane as their refuge from the world and a chance to unplug for several hours. While it would have been nice for we pilots to download weather products and flight plans, the system was so sluggish as to be of limited use. So, I decided against any internet access at all.

During the decade that followed, I heard from my more "connected" peers about pilots who quickly bring up social media accounts just a few minutes after the wheels are in the well. Some started out saying the internet was for flight-related purposes only, then they added access to online aviation magazines — that's flight related, isn't it? — and then came an aviation flick or two. After all, if "The Right Stuff" isn't aviation related, what is? A contract pilot friend of mine tells me of a pilot who became so engrossed in a "flight-related" video game, he was surprised by his aircraft's

Even crews with the best of internet intentions may end up as passengers in the cockpit.

top of descent chime. As the years went on, I felt my original decision was vindicated. But I also realized there were times when having that internet connection would have saved me a last-minute divert or could have rescued us from an hours-long ATC delay.

And now that we are about to take delivery of another new airplane, I was faced with the same internet question. The passengers still wanted refuge from the connected world and the new systems were still very expensive, but the capability of the new equipment has improved dramatically. Not only can we now rapidly download weather and flight plans, but we can also view nearly real-time weather radar animations. Most of the aviation world has embraced the internet allowing us to negotiate slot times, adjust ETAs, arrange destination support, get maintenance help and do just about anything from the air that was once reserved for before takeoff or after landing. So, my decision this time was different. We will have broadband internet access in our new cockpit. The only thing left to do about that was to come up

with a policy to avoid all those horror stories involving pilots disconnecting from their airplane as they connect to the World Wide Web.

The Regs

Relevant U.S. Federal Regulations point only to 14 CFR 121.542(d), which says "no flight crewmember may use, nor may any pilot in command permit the use of, a personal wireless communications device (as defined in 49 U.S.C. 44732(d)) or laptop computer while at a flight crewmember duty station unless the purpose is directly related to operation of the aircraft, or for emergency, safety-related or employment-related communications, in accordance with air carrier procedures approved by the administrator." This doesn't apply to us in the non-Part 121 world, but what about using a company-provided "non-personal" device or something you could broadly classify as a "non-communications device."

The FAA clarifies the prohibition in Vol. 79, No. 29 of the Federal Register (Feb. 12, 2014): The final rule does not require an "ownership" test regarding the laptop computer or personal wireless communications device. It doesn't matter who owns the device. The Federal Register also retains a

broad category of included devices because a list of specific devices would ignore the reality of evolving technology. This broad category includes, but is not limited to, devices such as cellphones, smartphones, personal digital assistants, tablets, e-readers, some (but not all) gaming systems, iPods and MP3 players, as well as netbooks and notebook computers.

It appears Part 121 crews are tightly restricted but the rest of us are not, unless we operators have come up with rules of our own. As a Part 91 operator, that responsibility fell on my shoulders. Advisory Circular 91.21-D, "Use of Portable Electronic Devices Aboard Aircraft," guides Part 91 operators on how to ensure these devices can be used but is silent on the subject of internet access. Should I restrict my crews (and myself) or should that mystical concept of "pilot judgment" be allowed to rule the day? When I don't know what to do, my first step is to find out what everyone else is doing.

A Non-Scientific Poll

Most of the flight departments that I asked rely on sound pilot judgment when deciding when the internet can be accessed in the cockpit and for what purposes. How's that working out? Many claim no problems, at least no problems worth noting. But many others admit things have gotten out of hand. Those flight departments with set SOPs usually recognize critical phases of flight and the nature of the internet browsing as key factors in the when and what questions. But these aren't the only factors.

Phases of flight. Most, but not all, SOPs recognized that internet browsing should be limited to non-critical phases of flight. Critical phases were usually defined as whenever below 10,000 ft. but sometimes included whenever the aircraft was in a climb or descent. While no canvassed operator included it, I thought I might consider short versus long flights or oceanic versus non-oceanic flights when deciding for or against internet usage.

Permissible Uses. Everyone I asked agreed that using the internet for weather, air traffic delay information and other flight-related needs was acceptable. Some operators specified that "flight-related" meant pertaining only to that particular flight. Many allowed crewmembers to check personal email, but some restricted this to just a few minutes each hour. (One operator

scheduled this so one pilot checks at the top of the hour, the other at the bottom.) Social media usage was specifically banned by some but not mentioned at all by others. A few specifically allowed pilots to use the internet to do a brief check of the news and sports. Those without any kind of internet policy admitted that some pilots would watch entire games or spend hours browsing on subjects completely unrelated to the flight in progress.

Most of the SOPs seem to deal with holding costs down more than reducing cockpit distractions. Streaming video is an obvious way to up the monthly charges, but other, more insidious expenses often play as big a role. One company found that its passengers were allowing software updates and other downloads that didn't need to be done from 35,000 ft. Their typical passenger was boarding with three internet devices, each serving to monopolize the bandwidth, especially if an automatic company or device update was in progress. Although cabin SOP to reduce monthly charges is certainly useful, what I needed was an internet SOP for the cockpit crew.

The most complete SOP I found for internet usage by pilots is a hybrid approach that gives wide latitude during non-critical phases of flight but permits only flight-related activities otherwise:

"On aircraft equipped with inflight internet, flight crews must not allow the internet to become a distraction. Crews may connect their internet-enabled devices and may use the internet. Crew devices must not be utilized during any portion of a climb or descent unless they are being used for flight-critical functions such as checking weather, NOTAMs, etc. In these situations, one crewmember must be heads up and dedicated to monitoring the aircraft. Playing games, watching movies or similar distracting activities are never authorized during climb, cruise or descent."

When this policy was instituted a pilot asked about reading internet websites and was told only aviation-related websites were permitted. The pilot then cheekily commented that, "It is OK to be distracted as long as you were reading an article about removing distractions in the cockpit."

I came away from this investigation wondering why there haven't been any aviation accidents due to this kind of "distracted driving" that is illegal on the streets and highways of many states. I

set out to prove a case against inflight internet browsing using the many, many aviation accidents that surely happened as a result of pilots distracted by a phone, iPad or other connected device.

Accidents: Real and Imagined

That list of many, many accidents turned out to contain just one. There must be more, but I found only one. On Aug. 26, 2011, a Eurocopter AS350 B2, operating under Part 135, impacted terrain following an engine failure near the airport in Mosby, Missouri. The helicopter experienced fuel exhaustion because the pilot departed without ensuring that the aircraft had an adequate supply of Jet-A. The investigation determined that the pilot engaged in frequent personal texting, both before and during the accident flight. He, the flight nurse, flight paramedic and patient were all killed as a result.

An addendum to that list might be the Oct. 21, 2009, flight of a Northwest Airlines Airbus A320 that continued on past Minneapolis-St. Paul International Airport (KMSP), its intended terminus. Early speculation was that both pilots fell asleep, but the NTSB later determined that they were using their laptop computers while discussing the airline's crew scheduling process. The NTSB report concluded, "The computers not only restricted the pilots' direct visual scan of all cockpit instruments but also further focused their attention on non-operational issues, contributing to a reduction in their monitoring activities, loss of situational awareness and lack of awareness of the passage of time." They were only alerted to their situation when a flight attendant asked about their arrival time.

Although there has only been a single reported accident involving internet distraction, I suspected there have been many close calls. Yet a scan of thousands of NASA's Aviation Safety Reporting System (ASRS) reports turned up only 243 incidents containing the word "internet" and of those only five involved distractions. And of those, three involved air traffic control towers or centers. The two pilot reports were both of captains complaining about their first officers.

Since there has been only one solitary accident from texting, cellphone use or internet access, should we conclude the risk is negligible? Or have we just been lucky all these years?

Internet Temptations

I've noticed a common theme among many cockpit internet users: Once allowed a limited number of acceptable uses, they gradually so expand the list that any limit becomes meaningless. I am worried about seeing this happen in my flight department because so many aviators I thought impervious to temptation have succumbed. The list of legitimate internet uses is a slippery slope indeed:

(1) Email and texts. It can't hurt to check now and then, especially considering many of these are work related. A message from a family member might be urgent. Or there may be a job opening you've been working on. Opportunity, they say, only knocks once.

(2) News. Wouldn't it be useful to know the president is showing up at or near your destination at about the same time? Indeed, there is a lot of news that can impact the success of your trip: blackouts, floods, earthquakes and forest fires, to name just a few. News can affect your livelihood as well. Just because you are flying doesn't mean your stock portfolio needs to suffer.

(3) Personal self-development. Some

(4) Entertainment. A happy pilot is a safe pilot, everyone knows. (If they don't know that, they should.) As aviators we are professional multi-taskers and switching between a 4 DVD set of "Godfather" movies and your oceanic cross-jump post position plotting is child's play for any seasoned international pilot.

I am still a few months away from delivery of my new airplane, equipped with Ka-band high-speed internet. I am told we will be able to download a complete weather package with satellite imagery just as easily as we can stream the latest blockbuster from Hollywood. My initial attitude is to forbid anything remotely connected to entertainment or personal communications while in flight. But so many others have felt this way when starting out on the cockpit information superhighway and have given in. Will I be next?

Advantages of Cockpit Internet

The pilots of my flight department were starting to suspect that I had already made a decision about internet usage, focusing only on the negative.



call it surfing and others call it browsing. Perhaps we can call it education. Why not spend those idle hours at altitude learning to be a better pilot? There are lots of good aviation websites and "e-zines" ready for that very purpose. Who couldn't benefit from a how-to in the most recent bow hunting magazine?

On our last flight to Europe my cockpit partner wondered out loud how nice it would be to have real-time weather for the Continent. Flying from Florida to the Northeast, he wondered aloud about ground stops in the New York area. His hints were obvious, of course. But they had the intended effect. I

needed to explore the pluses as well as the minuses.

Our flight department is paperless: each pilot has an iPad with an international cellular account and we don't spare expenses when it comes to quality applications. There are a number of apps that we use during flight that would be even more useful if connected to the internet. We also use several websites that are only accessible with an active internet connection.

ARINCDirect. We do all of our flight planning through Collins' ARINCDirect application. The company's iPad app gives us access to updated winds, turbulence and icing reports; destination weather reports; updated NOTAMs; flight hazards; TFRs; and other reports we normally get before departure but never while en route. Having all of this real-time information can be a useful decision-making tool.

ForeFlight. Our favorite weather tool is the suite of imagery available in ForeFlight. Here you will find just about everything available in the U.S. government-provided weather sites, but they seem to download more quickly and getting to the page you want is easier. Weather charts are available for most of the Americas, Europe, the Atlantic and the Pacific.

Gulfstream G500 pilot Steve Testerman updates Equal Time Point airport weather during an oceanic crossing, using an internet connection and the ForeFlight application.

MyRadar NOAA Weather Radar. If you are tracking a system along your flight path or at your destination, the MyRadar app is a good one to keep open because it updates quickly and the continuous loop gives a good sense of what the weather is doing and how it is moving.

Turbulence Forecast. This app is our "go to" source of U.S. turbulence information. The information is available in some of the other applications, but this is a quick way to get it, if that is all you want.

We normally update these applications prior to engine start, so as to have the most recent information. We also use a number of internet websites that are only available to us through our cellular connections; they are inaccessible in flight without an internet connection. We frequently check <http://www.faa.gov> for airport status and delays. And when things in the national airspace get really messy, we check <http://www.fly.faa.gov/ois/>



for any ground stops or airspace flow programs.

I was starting to soften on the subject of internet access, thinking maybe a very strict policy of only using a specified list of applications and websites might do the trick. On our way back from Europe last month I noticed the other pilot nod off once and I have to admit I felt the urge as well. We got a "Resume Normal Speed" message through data link, a first for us both, and that set off a mad scramble through our available resources to find out what it meant. Once we landed, I quickly found out — using the internet — that the ICAO EUR/NAT office had just released a new Ops Bulletin allowing "Operations Without an Assigned Fixed Speed (OWAFS) in the NAT." (If you haven't heard of OWAFS, check out NAT OPS Bulletin 2019_001.)

Thinking about the flight, I realized that with an internet connection we could have taken advantage of the resume normal speed message. But I also realized that our bout of sleepiness was instantly cured by the task at hand. Having something engaging to do solved any drowsiness for the remainder of the flight. I remember more than a few oceanic crossings when the urge to nod off was cured by having an interesting discussion topic come up. Perhaps there was something to be said for allowing other types of internet access.

Our Cockpit Internet SOP

Our team concluded that we should take advantage of the great situational

awareness afforded by having internet access in the cockpit, as well as the ability to keep pilots from nodding off on those long oceanic trips. But we needed to avoid the distractions caused by keeping connected with email, text messages, sports, news and all other things pulling our brains out of the cockpit. We mulled this over and came up with our first cockpit internet SOP:

(1) Two types of cockpit internet usage are permitted: flight-related and non-flight related. Flight-related usage pertains to internet access that has a direct bearing on the trip currently in progress. This category includes downloading weather products, making passenger arrangements, adjusting subsequent flight plans or anything needed to assure the success of the current trip. Everything else, even if tied to company business or aviation, is considered non-flight related.

(2) No internet access is permitted during critical phases of flight, which we defined as any flight time below 10,000 ft. (except while in cruise flight with the autopilot engaged), or whenever within 1,000 ft. of a level-off, even above 10,000 ft.

(3) Non-flight-related internet access is only permitted during flights with more than 1 hr. in cruise flight, and is limited to 5 min. continuous time per pilot each hour.

(4) Any internet access (flight- or non-flight-related) can only be made by one pilot at a time and will be treated as if that pilot was absent from the flight deck. Before "departing," the pilot flying

A Gulfstream G450 pilot accesses faa.gov website while inflight to check Teterboro delays.

(PF) will give a situational awareness briefing. For example: "The autopilot is engaged using long-range navigation. We are in cruise condition talking to New York center. You are cleared off." Upon completion, the PF will again brief the returning pilot, e.g.: "There have been no changes to aircraft configuration or navigation, but we are now talking to Boston Center and have been given a pilot's discretion descent to flight level three two zero."

(5) All internet-capable devices will be placed in "airplane mode" prior to engine start and will remain so until after engine shutdown. Audible notifications will be silenced for the duration of the flight. Pilots will ensure devices are not allowed to download software updates that may restrict internet bandwidth needed by the passengers or flight-related cockpit use.

(6) Crews will add a discussion of cockpit distractions to each day's post-flight critique. Our traditional "What's the DEAL?" check will become the "Were we IDEAL?" check:

I — Internet and other distractions: Did we live up to our SOP?

D — Departure: How did everything go from planning to wheels in the well?

E — En route: How was the en route portion?

A — Arrival: How did we handle the approach, landing and shutdown?

L — Logbook: Was there anything to report as far as maintenance or other record-keeping requirements?

So, the deed is done. We created our first cockpit internet SOP just in time to receive our new airplane. Not every flight department is this proactive. But even those that start with a well-intentioned internet SOP soon seem to abandon it because the lure of connectedness is too great. I hope to avoid this and have come up with a way to give us a "reality check" after we've grown accustomed to our new connected cockpit lives. We'll add inflight internet usage as a topic to our quarterly safety meetings.

In addition, I've asked each pilot to come up with a list of safety of flight risks that we "promise" to avoid. I'll put these in a sealed envelope and one year after delivery we'll see how we made out. I am hoping those risks remain avoided. If not, we may have to rethink all of this. **BCA**