ARE YOU REALLY PREPARED FOR AN ENGINE FAILURE? REALLY?

POPA

SPRING 2014

PILATUS OWNERS AND PILOTS ASSOCIATION

SINGLE PILOT IFR

Many Elements Come Together for a Successful Flight

EVALUATING STALLS IN THE PC-12

You might not know your airplane as well as you think

PT-6 OVERHAUL

Tips to grin and bear it

TIRED PILOTS

Fatigue can be a surprisingly big problem

TAX TRAPS

Know the rules, save some money

CONTENTS

PILATUS OWNERS AND PILOTS ASSOCIATION • SPRING 2014 • VOLUME 17, ISSUE 1

DEPARTMENTS

6 FROM THE PRESIDENT

8 NEW & NOTABLE

34 MIPAD
For Emergency Use Only... Not! The Best iPad Apps (and Accessories), Spring 2014.
BY JOHN D. RULEY

36 WEEKENDERS

40 ASK LANCE TOLAND
Do you ever carry cargo? Are you sure? And what about those dogs?
BY LANCE TOLAND

FEATURES

12 THE SINGLE PILOT AND THE PC-12NG
Many ingredients come together for a successful flight.
BY TODD HOTES

18 IF THE ENGINE FAILS, TRY TO KEEP IT SIMPLE
Despite the PC-12's remarkable reliability, every pilot should prepare for a loss of power.
BY JOHN MORRIS

26 A KEY TAX EXPOSURE AREA: PASSIVE ACTIVITY
Protect yourself with properly filed elections.
BY JONATHAN LEVY

30 BUSHED PILOTS
"The strongest have their moments of fatigue."
— Friedrich Nietzsche.
BY KEVIN GARRISON

42 PT6A OVERHAUL: AN OWNER/PILOT'S PERSPECTIVE
Do your homework, be skeptical and don't cut corners.
BY JOHN ZIMMERMAN

48 THE TRUTH ABOUT STALLS
BY THOMAS P. TURNER

From the President

2014 is off to a great start! POPA member activity continues to accelerate. Our forum is now seeing nearly daily activity — with discussions ranging from which airport to choose in a specific city to harder-hitting ones on aircraft issues.

A recent post noted we are well past one year without an accident! Training and learning is vital to flying. Our forums and annual safety conference are a great way to keep abreast of issues relating to our aircraft operations.

The Westin Harbor Resort in Savannah, Ga., will host this year's conference June 12-15. Please mark your calendars and plan to attend! We are hoping for our best one yet. We currently face the delightful dilemma of having more potential speakers than time slots. We anticipate selling out our vendor space again with products and services of interest to our membership.

We are also planning an off-site event on Saturday, similar to last year, which proved to be a great success. You will be transported to the Jepson Center for the Arts, where the evening will be spent walking around the center and viewing wonderful artwork. A reception and dinner will follow, with music by the Jeremy Davis Jazz Trio rounding out the night. What a fantastic way to wrap up your attendance at this year's conference.

The board, Laura Mason and I look forward to seeing you there.

Joe Howley

SPRING 2014 VOLUME 17/ NUMBER 1

NEW & NOTABLE

TECHNOLOGY FOR YOUR WRIST

Take a gander at the new Pebble, a wearable smart watch that talks to your smart phone, iPhone or Android, via a Bluetooth connection. Currently, there are more than 1,000 apps for the new device, including Pebble Canvas, which allows you to customize incoming info and design the look of your watch face with everything from weather to stock prices. You can even get notifications about incoming emails, calls and text messages on the device.

The Pebble is water-resistant down to 50 meters and, because of its lithium-ion polymer battery, you only need to charge your smart watch every five to seven days. The display is a 1.26-inch, 144-by-168-pixel Sharp memory LCD with an LED backlight. An onboard 3D accelerometer, a magnetometer and an ambient light sensor round out the device's talents. It weighs only 38 grams. Get more information at **GetPebble.com.**

GARMIN'S NEW ACTION CAM

Garmin had the huevos to take on the then-mighty BendixKing more than 20 years ago, and now they've got plenty of steam to take on GoPro with the Virb. Among the top features of the new camera is a battery that lasts up to three hours and an included color viewfinder. Pilots can see exactly what the camera is seeing before hopping into the cockpit and creating aviation. The Garmin Virb can also go just about anywhere because of the rock-solid mount that comes with the camera. And because it doesn't come in a housing, the Virb is not susceptible to fogging like the GoPro. Image quality (at 1080P) in ultra high definition. Picture yourself with a new Virb by visiting **Garmin.com.**

Best Hydrogen Reactor You Can Get

You would undoubtedly be the coolest guy at your airport, charging your phone or other devices with hydrogen! You can do it with Brunton's Hydrogen Reactor. A platinum catalyst in the fuel cell separates negatively charged electrons from positively charged hydrogen ions, and voila, there is a resulting electrical current. And because the hydrogen cells are solid-state, there's no discharge, no chance for your own Three Mile Island. The device comes with two cores, each one good for six charges. Additional cores are $20 a piece from **Brunton.com.**

SMARTPHONE WIND METER

This wind meter turns your smart phone into a high-tech meteorological tool. Simply download the free Vaavud app and plug the wind meter into your ear phone jack. The app gives you a clear overview of average, actual and maximum wind speed, as well as a real time graph. The unit of measure can be changed on the fly by simply tapping the screen. (Available units: m/s, Kmh, mph, Kts and Bft.)

The one piece, molded rotor and the low friction Teflon bearing makes this wind meter extremely durable. If sand or dirt gets inside the wind meter, it can easily be cleaned out with water. Works with all iPhones from 4 and up, and all iPads from 2 and up, running on iOS 6 or 7, and the Samsung Galaxy S2, S3 and S4. Find the wind meter at **Sportys.com.**

BINOCULARS AND THEN SOME

The rugged Celestron Cavalry 7 x 50 binoculars may be the most useful piece of equipment you can find. Engineered to withstand the elements, Cavalry is fully waterproof and nitrogen-purged to prevent internal fogging. The housing is protected by durable rubber armor, making the binoculars easy to grip while protecting them from hard use. The olive drab color offers concealment in the field.

As an optical instrument, Cavalry offers professional features including high-grade BaK-4 prisms and fully multi-coated optics for superb light transmission. Besides providing a sharp, bright view, this pair of binoculars features an LCD screen that shows GPS coordinates, compass information, elevation, date and time. Click **Celestron.com** to view the entire line.

ROCK YOUR HANGAR

Flying stories can be entertainment enough, but nothing compares to adding a little music to the scene. Enter the new Marshall Stanmore, a compact Active Wireless Stereo Speaker that yields clean and precise sound throughout the audio spectrum.

Its classic design is a throwback to the golden days of Rock'n'Roll!

With multiple connection sources, there are loads of ways to connect to your speaker. With multiple music options, you can connect to the Stanmore wirelessly via Bluetooth with APTX, or through of the three audio inputs (3.5mm, RCA, or Optical).

Inside the box are two 20W and one 40W speaker, as well as a ¾-inch tweeter and a 5¼-inch woofer. The Marshall Stanmore comes with two standby modes, PowerSave and Standard, to minimize your speaker's environmental impact when not actively in use. See the speakers in all their great colors at **MarshallHeadphones.com/product/Stanmore.**

Eyewear for Pilots

Sunglasses can make or break the experience of flying. That's why the Pilot Collection from Serengeti is remarkable. Made with world-class borosilicate optical glass from Corning, the eight models in this collection feature precision space-age hinges and adjustable silicone nose pads for the ultimate in long-wear comfort, designed specifically for aviation.

The Pilot Collection sunglasses are equipped with two distinct technologies to optimize common interactions with light, reduce eye strain and improve visual acuity: Photochromic (pioneered by Serengeti) which allows the lenses to adjust their tint to compensate for changing light conditions such as climbs and descents in and out of cloud cover, and Spectral Control, which manages specific colors to sharpen contrasts.

Serengeti is a member of Bushnell Eyewear headquartered in Suresnes, France. Find out more about the Pilot Collection at **Serengeti-Eyewear.com.**

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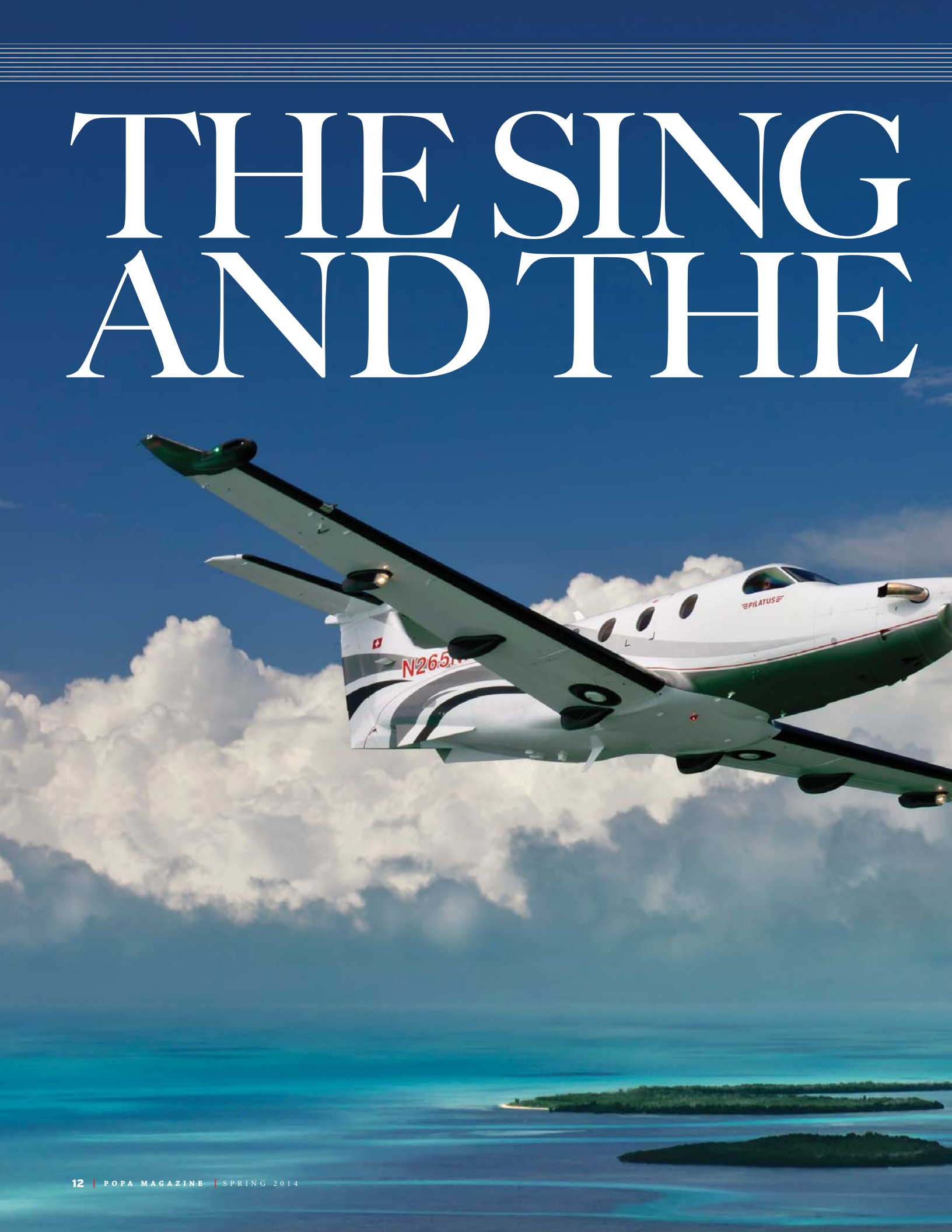

LE PILOT PC-12NG

MANY INGREDIENTS COME TOGETHER FOR A SUCCESSFUL FLIGHT ■ By Todd Hotes

Single-pilot IFR flying is a perfectly choreographed tango between the pilot with his/her skills (stick and rudder, knowledge, experience, common sense, systems management) and a dance partner (aircraft) with just as much capability. Luckily for us, the PC-12NG is the perfect partner.

What's more, many ingredients contribute to a successful single-pilot IFR flight. Most are taught at the very basic level of IFR training; however, as aircraft become more technologically advanced and pilots stray from the "fresh out of instrument training" mentality, the outcome is not always consistently safe. Consistency and standardization are what we strive for as PC-12 drivers. We must remember the basic concepts learned on the initial IFR rating (preflight planning, SOPs, cockpit organization, remaining AHEAD of the aircraft, utilizing time efficiently, SRM-Single pilot Resource Management, ATC management and flying the airplane) and use these with the latest automation to yield successful outcomes.

The Single Pilot and the PC-12NG

Follow along as I take you on my single-pilot IFR flight, departing Oakland County Airport in Michigan (KPTK) to Waterbury-Oxford Airport in Connecticut (KOXC). As the flight unfolds, I'll run through my thought processes and procedures used to accomplish a safe flight. It is my belief that you're only as successful as your last flight; my knowledge is not gospel. Rather, these are the techniques I used to fly many single-pilot IFR flights with safety. Though confidence is a useful tool when making single-pilot decisions, over-confidence WILL get the best of you. Let's begin:

CONDITIONS: LATE NOVEMBER, NIGHT, IMC.

Planning considerations:

- **Single-engine precautions:** Terrain, performance, weather, altitudes, etc.
- **Freezing levels** (Use of on-board de-icing equipment as a way to safely depart icing conditions, not a license to stay in it)
- **Fuel:** Route, approach, missed approach, and alternate fuel per FARs.
- **Preferred routes:** (Plan what you're most likely going to receive, rather than something based on assumptions.)
- **Suitable destination alternate and "escape plans":** To mitigate as much risk as possible along the route.

Remember, you're exponentially better off making as many decisions as possible while on the ground. Subsequent decisions made in the air are much more consuming.

The planning stage is now complete. and we move on to aircraft prep. Stepping into the airplane, I first organize and situate myself in a methodical manner. Luckily for the single pilot, organization is simplified thanks to the ample room up front without a co-pilot. I run through a flow and then subsequent checklist, a theme you'll hear repeatedly.

Next I place my printed flight plan and scratch sheet on a clipboard (because loose papers are a single pilot's nemesis in IMC). I keep them neatly in one place. Doing so helps facilitate knowing exactly where loose-leaf information is kept and makes for easy retrieval in the dark.

Once situated, I configure the airplane. I've flown the PC-12 for a while. I understand the airplane and my procedures well; however, I still follow my flow and checklist procedures to a T. I can't stress this enough. So many things happen simultaneously, it would be an injustice to operate otherwise. Similarly, you'll hear me use "call-outs" as if I had a second pilot, in order to maintain the standardization. After all the preflight checklists/setups are complete, I give a final check of the weather en route and at my destination (hail to the iPad!), and we're ready to go.

The winds are light, and the departure runway is my choice. I elect to take off from 9R, the runway that will allow me to have the ILS right behind me should I need to make a 180 back (altitude dependent). I select it in preview. Again, it's better to set it and forget it than to struggle in IMC at 1,000 feet. The radar's on (to actually see what's ahead), checks are complete, and we're off. Regarding NEXRAD: Well, it's a beautiful thing but understand its limitations. Be aware of its time delay!

Advancing the power, I listen to the engine, sensing normal acceleration, and I'm watching the gauges while I say my call-outs. I rotate. No runway remaining, gear up. At 400 feet, I retract the flaps and, at 1,000 feet, I run the climb flow and checklist. As I proceed upward, I hand-fly with the flight director on. I don't see a need to practice raw data flying in solid IMC. Why, you ask? Well, I like to hand fly shortly after take-off in order to understand the aircraft in the current conditions, bring my basic instrument scan up to speed, keep things simple (as far as automation) while I'm close to the ground, and have a little fun! After all, we're Pilatus pilots; we fly because we enjoy the act of flying. Why drive a Porsche if all you do is sit back, set the cruise control and let the car drive you!

I pick up a little ice passing through 8,000 feet, and I turned the autopilot on, enabling

me to focus on other necessary tasks as the single pilot. I do disengage the autopilot periodically to feel the handling characteristics with the ice. I'm consciously aware that the autopilot can mask symptoms of "funny aircraft behavior."

Freeing my brain from having to move control surfaces, I now have time to manage the flight, evaluate "escape plans" should a troubling situation arise, and search for my final cruise altitude, taking into account the environment and "emergency time" as a function of altitude and glide distance above the ground. Again, the beauty of the PC-12 is the flexibility in altitude planning. Though my planned altitude was 25,000 feet, I've settled on 21,000 feet. A change in plan, yes, but as long as you're managing your tasks and have done your homework on the ground, you'll find that any change is not a big deal. You're prepared. Adjust and amend are important parts of single-pilot flying.

In a crew environment, things generally calm down upon leveling off. As a single pilot, this is when I start taking advantage of down time. We're now level, so I begin to plan for the descent, approach, and missed approach, should I have to initiate. I do so with a check of destination weather. I assess the reported winds, visibility, ceiling and any other pertinent information. I consider my initial runway plan according to the winds and visibility and build the approach by putting it into the FMS. I set the full approach in order to have all fixes at my fingertips.

Then I place ATIS in standby Radio 2 even though we're a long way out, and then I pull up the plate on the chart preview. Sure, I've flown this approach many times; however, as a single pilot, complacency will be my worst enemy. For that matter, complacency is the enemy of a two-, three- or four-person crew!

Prepared for the later stages of the flight, I can now focus on talking with ATC, finding shortcuts and monitoring the weather below me, near me and at my destination. This helps me understand weather trends. Then I repeat it all over again. This helps me to remain vigilant and demonstrates good airmanship.

As I begin my initial descent, there's no sense of urgency now that I'm prepared. I've listened to ATIS and I've already called "in range." The descent checklist is complete; I'm ahead of the curve. Descending back into the clouds, I'm now picking up ice again. Use ATC to your advantage. Ask for reports ahead and listen to others in the area. You're PIC, and it's your butt in the seat. If you don't like something, say something!

Getting closer now, I've leveled off on vectors to the approach. All checklists are complete, and the approach is loaded. I have a minute before our last vector, so now is a good time to set Radio 2 active frequency to CTAF (making sure PCL lighting is the same frequency), announcing my position (still listening on Radio 1, of course), and clicking the PCL seven times to light up my arrival. I check outside for ice again. The GS is now coming in. I configure the airplane and mentally prepare to head down. GS captured, I set the missed approach alt and I call out 1,000 feet above on profile, 500 feet above on profile, 100 feet above. Minimums — and runway in sight! (Autopilot off) I touch down, complete the after-landing checks and taxi in. Another safe single-pilot IFR flight accomplished!

The moral of this story is that the PC-12 is an inherently capable IFR airplane for single-pilot flying. The systems on board and the manner in which the information is presented make the ergonomics of handling an IFR single-pilot flight manageable and downright fun. Nevertheless, it's up to you as the pilot to manage your PC-12 systems with knowledge, stick-and-rudder skills, standardization and workload management to facilitate a systematic and thus safe approach to flying alone.

Common sense will also take you a long way. POPA

Todd Hotes is a chief pilot and former Airline Check Airman.

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IF THE ENGINE FAILS, *TRY TO* KEEP IT SIMPLE

DESPITE THE PC-12'S REMARKABLE RELIABILITY, EVERY PILOT SHOULD PREPARE FOR A LOSS OF POWER. ■ By John Morris

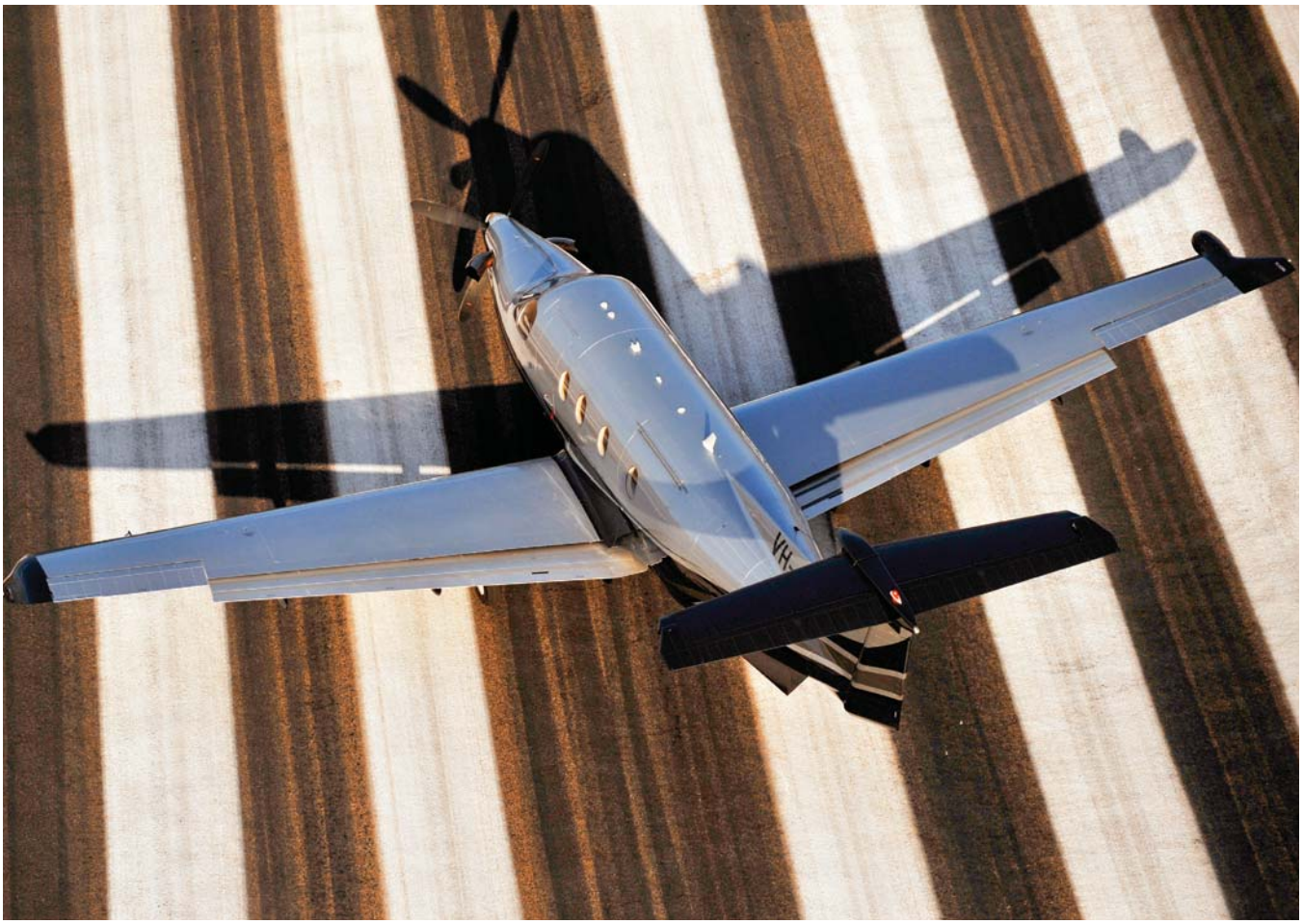
So we do prepare with on-going training and hangar flying discussions on how best to handle a particular situation, in this case an engine failure during cruise flight (or above several thousand feet AGL).

Since initial publication of this article, the PC-12/47E (NG) has joined the fleet, and avionics have been upgraded to the pre-/47E fleet. This provides a great opportunity for a refresher. The original version of this article is available at the POPA website or from my website.

Nobody likes the idea of really having to deal with an engine failure. One of the primary reasons for operating the PC-12 is the engine's reliability. But to fail to prepare for the possibility is worse than the engine failure itself.

So we do prepare with on-going training and hangar flying discussions on how best to handle a particular situation, in this case an engine failure during cruise flight (or above several thousand feet AGL).

Over many years of instructing the PC-12 pilot, I have heard multiple ways of accomplishing the task of returning to terra firma after an engine failure in flight. This article will deal with what I believe is the simplest method to reduce the thought process from what could be a very stressful event into a successful outcome.



THERE ARE THREE BASIC STEPS:

- Establish glide
- Find the nearest airport
- Find the key point to landing

That's it. Of course, you should already be familiar with steps one and two and maybe three, but I will now break down the components of these three elements and, after a little practice (in-flight with the engine running), you should be able to accomplish these steps easily.

STEP ONE: ESTABLISH GLIDE

(Also known as FTFA — Fly the freaking airplane!)

And, oh by the way, the engine failure occurs when it's not VFR, or daytime, or both. Sea level or flat land is too easy and not realistic. You have got to THINK about this.

So, of course the next thing you should do is **shut down/feather the engine.** I know you were already thinking about establishing glide, but first things first. If you do not do this minor task, we will reach the ground a lot sooner than expected!

The glide ratio of the PC-12, or any aircraft, is not affected by weight. The only variation is the speed of the glide, which is determined by weight. Maintaining the correct speed is very important for maximum glide and critical when making turns. Using the Glide Speed chart from the POH **(see chart to right)**, along with distance and time performance charts, the approximate vertical rate of descent and glide speed can be determined.

The (glide ratio) rate of descent is approximately 800 feet per minute. The glide speed to maintain the 800-foot-per-minute rate will require more information and time to calculate. If we simply set this rate using the VSI, when stabilized, and the angle-of-attack indicator, with the angle [AN] box-TOP, centered to the middle, open circle on the EADI **(see chart to right)**, the approximate indicated glide speed will result. Note: The center pointer of the angle-of-attack box (Dynamic Speed Bug /47E) is the 1.3 Vs ref speed and glide is slower than the ref speed for the particular flap setting.

GLIDE SPEEDS FROM POH(S)
Sect 3, para 3.2B

WEIGHT-LB	KIAS	
10450	119	/47E
9920	116	/47E
10450	116	/47
9920	114	/45
9040	110	/41
8160	105	
7280	99	
6400	92	

**/47E

With Build 8 and after, AoA is replaced with Dynamic Speed Bug (DB).
Estimating glide speed becomes more prohibitive since DB is referencing 1.3Vref to indicated airspeed

Once glide speed is established, engage the Indicated Airspeed (IAS)/SPD Mode on the autopilot, and autopilot ON if not already activated.

STEP TWO: FIND THE NEAREST AIRPORT

This step is more than just finding the nearest suitable airport, so be patient and read on.

First, before you do anything, I have to ask what might be considered an insulting set of questions, but:

- Do you know how to find the nearest airport from your avionics?
- What is your nearest airport criteria selected in your avionics?
- How much runway will you really need to land?

Don't forget density altitude! I can answer the criteria question. About 1,500-2,000 feet should cover the density altitude. I am not sure if the database for airports holds 1,500 feet or shorter length runways,

Once the nearest airport is selected, proceed toward the airport using Heading (HDG) mode from the autopilot, not NAV mode.

Does the nearest airport have a published approach? If so, load in the nearest approach runway from your present heading. Next, locate the runway-end waypoint from the loaded approach and select direct to the runway-end fix. (If no RW-end fix then direct to airport and the MAP should do). If you were operating the autopilot on NAV mode, at this moment your course would change with the movement of the CDI. Be aware that eventually the course will have to be adjusted manually for the runway.

Do not use vectors-to-final! This will cause distance information to be inaccurate since distance will be to FAF, not runway threshold.

Another point to this procedure is to set the EFIS (pre /47E or mod PFDs) to the CDI page with GPS as the primary NAV source, not the GPS moving map page with the CDI indicator across the bottom, as the moving map will be selected elsewhere and your attention should be limited to airspeed/altitude and position relative to your landing point. The /47E folks are best served by just scaling the INAV map range lower as the desired airport gets closer.

Now since the CDI is probably not pointing directly towards the airport, how do you navigate toward our desired fix? You should select one of the bearing pointers to the GPS/NAV being used for this procedure, available from the EFIS/PFD control panel.

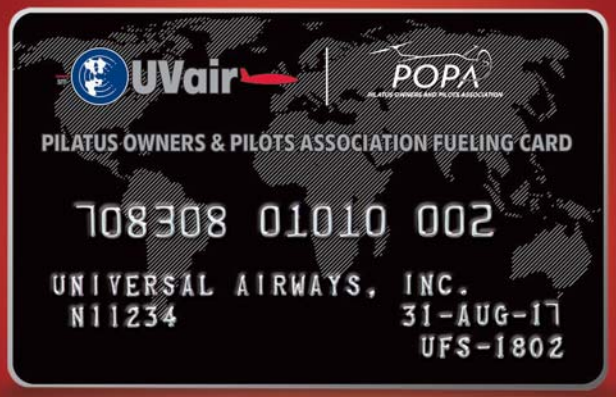
It will point to the current fix selected, the RW-end fix maybe? And it will show distance to that fix from either the lower left or lower right corners of the EHSI/PFD, depending on which bearing pointer is used.

Note: If an approach is not available, then proceed via the airport diagram page of your GPS/INAV and orient to the nearest runway alignment. This task will give you absolute mileage to the airport and a directional-intercept-course picture to the runway or fix centerline.

In either case, if time permits, from the above step you should look at the airport page for relevant information prior to your un-scheduled arrival, such as ATIS, since if you can, it would be nice, but not necessary, to land into the wind.

Select/refer to the moving map page on your GPS/INAV, or MFD, if available. Reduce the map scale to a maximum of two miles.

Get Less



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To me this is a very important component. This "procedure" is usually practiced in a controlled environment with the element of failure really not a factor and the visibility sometimes not impeded. In an IFR environment, you may not see the airport until 500-700 feet AGL (we hope). Do we always fly day VFR? Leaving the scale at two miles, or even one mile, will give you the airport diagram/runway(s), when within that distance to your present position.

At greater scales the airport environment becomes a symbol. Even if we are making a straight-in approach, knowing where we are relative to the runway is very reassuring and necessary. Even if it is not going the way we would like, we still must configure the aircraft for touchdown.

In known prior incidents the pilot(s) were so pre-occupied that the flaps were never deployed. It is forgivable to "forget" the landing gear but not the flaps since stall speeds are predicated on flap position and a reduced stall decreases our touchdown speed. Also, once the scale is set, **leave the darn GPS/INAV/ MFD alone.** You've still got to maneuver the airplane.

What's all this doing for you? It's called situational awareness using the available equipment. Good practice everyday.

STEP THREE: FIND THE KEY POINT TO LANDING

Pilatus believes, as I do, that the ideal key point to landing is to be downwind, clean, abeam, ideally one half to one nm, of the touchdown point at 1,500 feet AGL. The touchdown point is considered the end of the runway, not the center since the nearest runway that you may be heading for may only be 2,000 feet. That's why we select the RW-end fix from the GPS/NAV for distance information (not to mention a bearing point).

From the key point, heading downwind, extend the landing gear (free-fall) and flaps to 15 degrees. How long does it take for flaps to 15? How long does it take for the landing gear to free-fall? That's 22 and 25 seconds, so wait for the flaps to get to 15 degrees, then start a standard rate turn to final, monitoring your position relative to the (MAP) to the centerline of the runway for bank adjustment.

Remember that once extending flaps you will have to adjust you glide speed to the basic known glide speeds with flaps. Note that while extending the flaps to 15 degrees, the vertical rate of descent was reduced, giving us a momentary "lift" and reducing altitude loss for the turn.

Monitor the position of the landing gear. If all works as it should, by the time you have slowed to the glide speed for 15 flaps, the landing gear will show three green. If not, use the hand pump to finish. Once on final, you should have approximately 500 feet to go, hopefully visual, and about a quarter- to half-mile to the end of the runway. This will allow for judgment on use of the remaining flaps.

Now, how you get to the key point is up to you, with a little help from your friendly instructor, based on the available altitude and distance.

An immediate concern once heading toward the nearest airport is "Do I have sufficient distance?" The performance charts indicate a little over two nm per 1,000 feet of altitude loss. So a quick "WAG" can be made for that question, but don't forget your current height above ground! For the purposes of this article you will have more than the needed miles so you will have sufficient altitude.

SO HOW DO YOU ARRIVE AT THE KEY POINT AT 1,500 FEET AGL?

Note that the following moves are to help reduce the brainwork involved, in order to increase the chances of a successful outcome. The training/hangar flying discussions I am referring to involve how we approach the airport once it has been established that we have sufficient altitude to attempt one of the many "key procedures" solutions.

IF you have sufficient altitude above the airport, proceed to a point above and near the airport or the key point to landing.

Standard-rate turn is a turn of 3 degrees per second. A complete 360-degree turn takes two minutes. A rule of thumb for determining the approximate bank angle required for a standard-rate turn is to divide the true airspeed by 10 and add one-half the result. For example, at 120 knots, approximately 18 degrees of bank is required (120/10 = 12 + 6 = 18). At 200 knots, it would take approximately 30 degrees of bank for a standard-rate turn.

Other than inducing drag via landing gear or flaps, how can we safely lose altitude to arrive at our key? Turns, time and patience.

What is the standard rate of turn at 110 KIAS? Approximately 17 degrees of bank (see above reference formula).

How much altitude is lost for a 360-degree turn? Approximately 2,000 feet of altitude (800 fpm plus the additional loss due to banking-maintaining airspeed).

So doing a 360-, 270- or 90- degree, standard-rate turn, you should be able to deduce the altitude loss from your position. What happens to the altitude loss if you double the rate of turn (34 degrees of bank)? The altitude loss rate is approximately the same but you accomplished a 360-degree turn in one minute instead of two minutes.

See where I am going? By applying this basic knowledge you can maneuver at a point (the key, perhaps?) until arriving at the desired altitude. Remember a holding pattern? Four minutes, two turns and two straight legs — how much altitude would you lose applying this basic technique? About 4,000 feet of altitude.

It should be noted that the autopilot is designed for 25-degree bank angles. This is why you should not use the autopilot once you start this procedure unless you intend to steepen the bank on purpose.

So what if you arrive at the key point too high? If you have the above paragraph settled in your mind, then the question is already answered. Time. Extend the downwind accordingly, keeping in mind the 180-degree turn to final and the altitude loss during the turn. Don't worry if you are not at 1,500 AGL (too low). If you were patient, and had set up the moving map correctly, you would have seen this coming and altered your path to any available runway (or if slightly low, start your standard turn to final immediately at the key point while deploying the flaps and gear, but still no rush).

Once the set-up procedure is practiced in your aircraft (not that hard to do if you give yourself a chance), it should become apparent that the process will not take that long. I believe if you understand this turn/time principle for gliding, you can apply this toward any possible landing contingent and not confuse yourself with the multiple "what if" type key approaches.

FOR YOUR INFORMATION:

Here is an approximated turn radius chart based on the Max Gross Weight stall speed of 91 KIAS and Glide speed of 114 KIAS.

BANK ANGLE	TURN RADIUS	STALL SPEED
45°	1156'	108
40°	1378	104
35°	1651	101
30°	2002	98
25°	2497	96
20°	3176	94
17.5°	3666	93

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A KEY TAX EXPOSURE AREA: PASSIVE ACTIVITY

PROTECT YOURSELF WITH PROPERLY FILED ELECTIONS ■ By Jonathan Levy

A notable milestone in the cat-and-mouse game of individuals seeking to minimize their tax burden and Congress making new laws to end potential shelter activity is the Passive Activity Rule, which was originally enacted as part of the Tax Reform Act of 1986. Recent developments have brought it to the minds of tax advisors. In particular, an important one-time opportunity to avoid being trapped under this rule arises from new IRS regulations, issued in November, due to the new net-investment income tax passed as part of the 2010 Patient Protection and Affordable Care Act (aka Obamacare). Without proper planning, the Passive Activity Rule threatens to deny taxpayers the ability to utilize deductions to which they are fully entitled.

THE PASSIVE ACTIVITY RULE

Lawmakers consider the Passive Activity Rule necessary because of the way the tax law allows businesses to write off the cost of equipment: Each item is assigned a schedule (stated in terms of a percentage of the purchase price each year) for writing-off the cost of the property. This provides the business with a tax deduction, even though the business has not actually, in the year of the deduction, incurred any cash expense. The theory in allowing the depreciation deduction is that it corresponds to the amount of value the property lost during the given year and, thus, the depreciation rules simply allow the business to accurately report its income by taking into account the loss in value that has occurred but that has not yet been reduced to a dollar amount and realized under the accounting rules. However, as a further measure, Congress has chosen to *encourage businesses to invest in equipment* by allowing these write offs to be taken over an accelerated period. For example, a non-commercial business aircraft can generally be fully written off over a five-year period, even though its true economic useful life may be much longer.

However, in creating the Passive Activity Rule, Congress determined that the benefit of accelerated depreciation should not be freely available to business equipment in all cases, but only under appropriate circumstances. The Senate Finance Committee, in enacting the Passive Activity Rule, wrote that, "in order for tax preferences to function as intended, their benefit must be directed primarily to taxpayers with a substantial and bona fide involvement in the activities to which the preferences relate." (The provision for accelerated depreciation, discussed above, is the most prominent example of the "tax preferences" the committee refers to.) To accomplish the goal of restricting "tax preferences" to taxpayers who have "substantial and bona fide involvement" in the underlying activity, rules were established to divide items of income and expense into two categories — passive and non-passive (generally referred to as "active").

The first essential concept in separating passive from non-passive is the concept of an "activity," which is an abstract notion that can be thought of as the way a person might answer the question, "What business are you in?" Some people will have multiple answers to that question (if they engaged in more than one business). Some will have a single answer (for example, a W-2 employee who has no side businesses), and some will answer with none (a retiree). Each is a candidate for being considered an "activity" under the Passive Activity Rule.

Once the activity has been ascertained, it will be consid-


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CLOSED

ered passive if either (1) the individual does not "materially participate" in the activity (based on a complicated definition, but generally meaning more than 500 hours of work in the given year), or (2) the activity is a "rental" activity (another complicated definition, but generally referring to activities that make money by selling use of tangible property to others, such as a leasing company); of course, various exceptions apply.

When a passive activity incurs losses, those losses cannot be used as a tax deduction against income from non-passive activities. Rather, the losses accumulate until either used to offset other passive income or until the passive activity is disposed of. At that time, the formerly passive activity becomes non-passive, and the accumulated losses can be used to offset non-passive income, thus reducing net income and therefore tax. When passive activities generate income, that income, starting in 2013, is subject to an additional 3.8 percent Net Investment Income Tax, on top of regular income tax, if received by a high-income taxpayer (starting at $250,000 per year for joint filers).

DEFINING AN "ACTIVITY" WHEN BUSINESS ENTITIES ARE INVOLVED

The activities of an individual can include not only what he or she does personally, but also activities conducted through related business entities, whether they are partnership, LLCs, S corporations, or even certain C corporations. Once entities are involved, defining an individual's activities can be quite vague. Take, for example, a real-estate developer who is engaged in developing 10 different properties, with each property being, as is common in the industry, owned by a different, though related, LLC. Is such a developer involved in a single activity of real estate development or is he involved in 10 different activities, one for each project? The tax law largely permits the individual to decide the answer to that question, so long as the answer represents one of the various ways these entities can be carved up into appropriate economic units. Traditionally, the individual was not forced to declare to the IRS his chosen method of divvying up the entities into activities. Since 2011, however, taxpayers have had to disclose the chosen grouping to the IRS or be subject to a default rule that each LLC will be regarded as a separate activity.

THE CONSEQUENCES OF TREATING ENTITIES SEPARATELY OR TOGETHER

Under the default rule of treating each entity as a separate activity, it is likely that at least some of the hypothetical development projects would be considered passive because it is unlikely that the developer "materially participates" in all 10 (which would require as much as 5,000 hours of work per year). If the passive ones were generating losses, this would mean that those losses could not be used to offset income the developer has from other, active, sources. On the other hand, treating the LLCs as separate activities may make it easier to later convert accumulated passive losses to active ones because it will be easier to dispose of a single LLC (and therefore of an entire activity, which would convert its accumulated passive losses to non-passive) than it would be to dispose of the entire collective endeavor of 10 LLCs.

HEIGHTENED IMPACT TO AIRCRAFT

For numerous reasons, a common aircraft-industry practice is to purchase a business aircraft in a dedicated, special-purpose entity and then have that entity lease the aircraft to a related company for that company's use in its trade or business. Typically, the aircraft-ownership entity will generate tax losses, due to depreciation, while the lessee/operator entity which conducts the main business may be very profitable. It is extremely valuable for the principal in both related companies to be able to offset the income earned in the operating company with the losses generated in the aircraft-ownership company.

However, if the principal neglects to make an IRS grouping disclosure declaring that the two entities should be treated as part of the same activity, the two entities risk being treated as separate. The likely result of such treatment is that the aircraft entity will be deemed passive, either as a rental activity, or because the principal does not materially participate in it, in isolation. The tax depreciation losses generated by the aircraft will not be usable to reduce the principal's individual income taxes, unless he or she receives significant passive income, which usually is not the case.

This means it is essential for aircraft owners to properly submit the Passive-Activity grouping election to the IRS, which will generally require coordination between the individual's 1040 tax preparer, and those who prepare the tax returns for each entity. This is true because the grouping election must be filed with the 1040 return, but depends on the nature of the activities carried out in business entities owned, in whole or in part, by the individual.

ONE-TIME OPPORTUNITY TO CORRECT ACTIVITY GROUPING

Generally, once a taxpayer has declared his/her chosen grouping of activities, that decision is irrevocable unless changed conditions render it clearly inappropriate, in which case the taxpayer must file an explanatory statement with the IRS. However, in recent regulations, the IRS provides a one-time opportunity to make changes without providing justification.

Starting in 2013, the new Net Investment Income Tax raises the tax rate on passive income. Before this new tax, it was often desirable to treat income-generating activities as passive rather than active because this would mean that the income from them might be offset by other passive activities. The fact that passive activities may now be subject to a higher tax rate radically changes this analysis.

Recognizing this unfairness, the IRS will allow a one-time regrouping of activities, without the need to show that the prior grouping was clearly inappropriate. Complex eligibility criteria govern when a taxpayer is able to take advantage of this fresh-start, but it is generally available in the first year the taxpayer would (without the re-grouping) be required to pay Net Investment Income Tax.

CONCLUSION

The Passive Activity Rule, if not appropriately handled, has the potential to present an unpleasant surprise to many aircraft owners. There are numerous cases where simply filing a piece of paper (the grouping election) can make all the difference. Tax return 1040 preparers who are not versed in the subject matter should seek guidance before filing tax returns without such elections that may come back to haunt.

This article provides a basic introduction to a complex area, but only covers a small portion of the field. Always consult a qualified advisor. POPA

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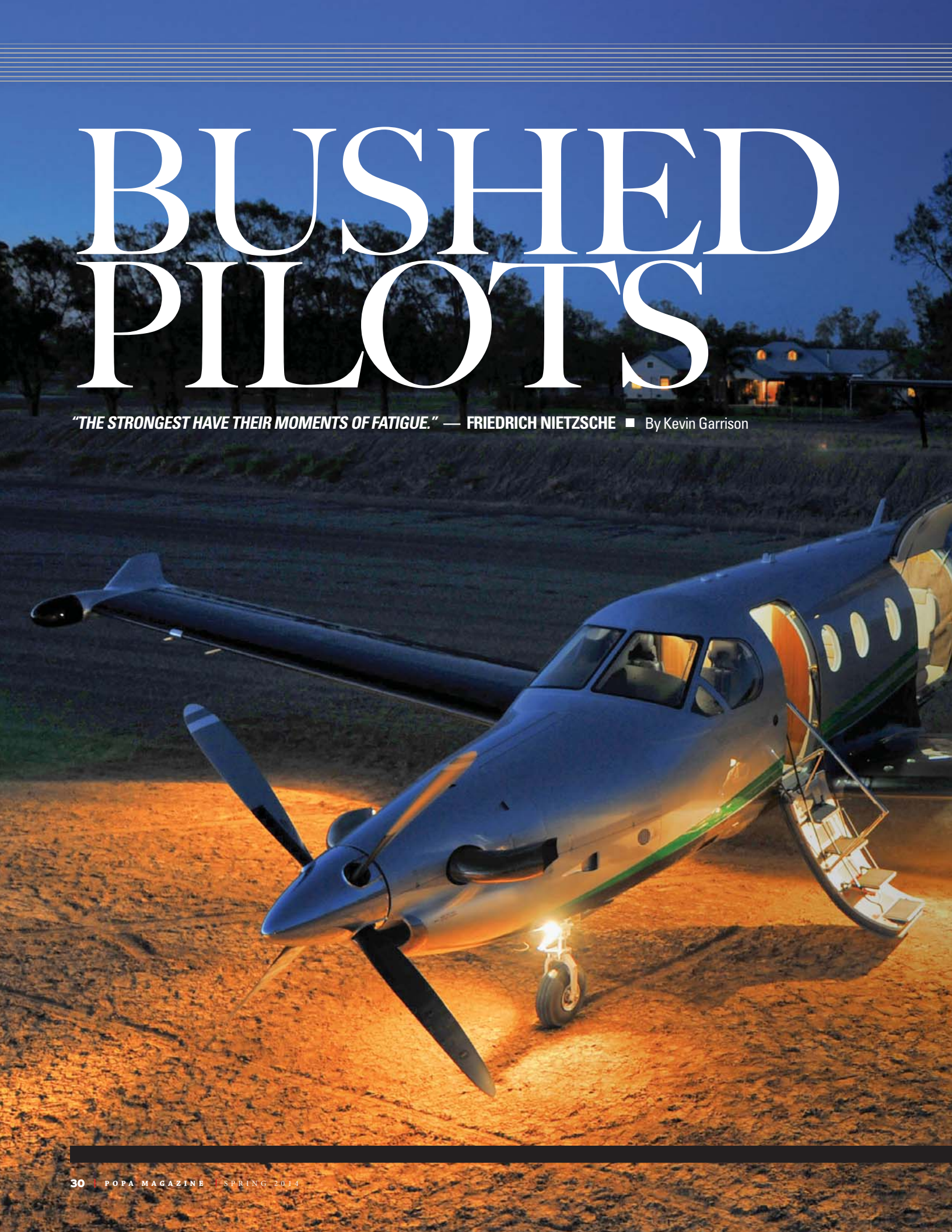
BUSHED PILOTS

"THE STRONGEST HAVE THEIR MOMENTS OF FATIGUE." — **FRIEDRICH NIETZSCHE** ■ By Kevin Garrison



The planet Venus was on a collision course with an Air Canada jet that was mid-ocean on a long, overnight flight a few years ago.

Waking from a cozy nap, the co-pilot saw the bright light of Venus in his windshield and mistook it for an oncoming aircraft. A steep dive kept the aircraft from colliding with the planet, but 16 passengers were injured when they were flung to the ceiling of the cabin.

General Aviation pilots can also mistake heavenly bodies for potential disasters when they are tired. For example, once when I was flying an all-night cargo run, I mistook the rising moon for a forest fire. I reported the fire to ATC and flew toward the moon for about 10 minutes so I could give the location of the fire to the controller.

Aircraft that operate with more than one pilot in the cockpit and one of them too tired to fly are dangerous, but single-pilot operations with a sleeping or fatigued pilot can lead to disaster. Tired pilots clearly don't make the safest of pilots, yet a perfectly rested pilot is extremely hard to find. The pressures of life, business and flying itself lead to fatigue that can lead to mistakes and accidents.

The FAA has recently changed the mandatory rest rules for airline crews based on studies that discovered what everybody already knew – limited rest for pilots equals less safe flying. Most accident and incident reports are based on comparing the amount of rest that a particular pilot had in relation to the FAA regulations about minimum rest. For example, a pilot coming off of a 24-hour break is considered to be much more rested than a pilot coming off of a 10-hour break.

The idea that time away from the airplane equals quality of rest and sleep is not always a very good measure of how alert you are when you fly. You might have a sleepless night with a cranky baby at home during a 24-hour break from flying and have wonderful night's sleep the next night when you are in a quiet motel alone.

Lack of quality sleep and rest is the real issue. Measuring a pilot's alertness is a very difficult thing to quantify and is doubly hard if you are operating a government agency like the FAA. It is very easy for the individual pilot to know if he or she is too tired because each knows how he or she feels, but a feeling is impossible to measure. A long period without adequate sleep for a pilot can be as debilitating as drinking alcohol and then flying. Pilots who would never fly drunk often allow themselves to climb into their aircraft after a long day of business meetings to make the long flight home by themselves without rest. A large percentage of fatigue-related General Aviation accidents happen during just such a scenario – a professional pilot flying home at night, usually solo, after a long day.

HELLO? AM I AWAKE?

It seems silly to think that a person capable of flying and quite possibly owning an aircraft needs to be told how to figure out if he or she is too sleepy to fly, but it is the very fact that most pilots are goal-driven achievers that makes them susceptible to nodding off at the controls. You may have pulled all-nighters at college or served exhausting internships while becoming the accomplished, steely-eyed, competent person you are today. Most professionals have served some sort of trial-by-fire period in their lives as they prepared for or began their careers.

How do you know if fatigue is creeping in and making your flight less safe? In the same way you knew you were becoming too tired to operate back when you pulled all-nighters at work or school. You have personal "tells" – things that indicate to you that it is time to get some rest.

They're probably little things, like not being able to find a pen or pencil to write down a clearance, missing a frequency change, eyes that feel as if hot sand has been flung into them and even certain postures your body involuntarily assumes when you are exhausted. They can tell you when it is time to quit. My personal tell is my upper lip becomes a little numb, and I get a little buzzing/ringing in my ears. Weird, I know, but if you think about it, I bet you have your own little odd fatigue clues.

Many pilots are in the sky flying home in the dark clouds before they realize that they are getting too sleepy and tired to fly. Of course, a diversion to a nearby airport and motel is the easiest answer to this problem, but sometimes you have to use techniques to stay awake until you land safely.

HEY, WAKE UP!

Knowing that you are becoming too tired to fly can make your flight safer even if you have hours before you can safely land. If you are flying with another capable pilot in the cockpit, you can use the age-old airline and corporate pilot trick of taking a power nap.

The power nap is also known to pilots as "watching for satellites" or "checking out the inside of my eyelids" or even sometimes "watching the overhead panel for problems." Whatever you call it, a short 10- or 15-minute period of relaxation with your eyes closed can give you a huge boost.

You should remember two things if you are going to take a power nap in flight. First, tell the other pilot that you are going to sleep for a while. Next, be sure your seat is far enough back from the controls to keep you from hitting them if you have a spastic movement, like a jerky leg, when you sleep.

Napping, even power napping, when you are flying by yourself is obviously a very bad idea, but telling someone else you are tired is not. ATC controllers can be helpful if you ask them the right way. Saying "I am too sleepy to fly" would not be the smart thing to do, but if the controller gave you route clearance direct to a fix or intersection you aren't familiar with, there is no harm in saying: "Hey, it's getting a little bit late at night up here. Can you spell that fix for me?"

If you really think you are in trouble because of overpowering fatigue, don't be shy about sharing it with a controller, who can help by giving you vectors and flight following. Being too tired to fly is just as dangerous as an in-flight fire.

Here are some last minute stay-awake tips that I have used that might help you:

SING!

I have been known to sing at the top of my lungs when flying late at night by myself to keep myself alert and awake. I was singing without the benefit of a car radio to back me up, but if music is available in your cockpit, feel free to sing along – as loudly as you can. Of course, ATC gets priority here. Don't let your loud rendition of "Stairway" keep you from that next frequency change.

DRINK SOME JAVA

A shot of caffeine into your system can help keep you alert. Coffee might not be an option in your aircraft, but a high caffeine soft drink would certainly fit in your flight bag. Too much caffeine is certainly not considered a help, but a strong cup of coffee or an energy drink has saved more sleepy pilots from late-night disasters than we would probably like to think about.

TAKE A FRIEND

I used to take my dog with me on my late-night cargo runs. He was good company, enjoyed flying and even though my dog slept through most of my flights, he helped me stay awake.

Many pilots who are rich enough to afford an expensive aircraft think they don't have the money to pay another, perhaps younger, pilot to travel with them. Bringing another pilot with you, even if you have to pay him or her, is a good investment in your safety if you are facing a long day and perhaps bad weather. He or she can rest during the day and be an alert companion or even the pilot on the way home.

SUCK ON SOME O2

A little hit of oxygen, even in a pressurized aircraft, can help you regain some alertness. Cabin altitudes above 5,000 feet at night can reduce your vision and alertness. Just put on and use the crew oxygen mask a few minutes every hour, and you will get a boost in energy and wakefulness.

DO WHAT IT TAKES

Only you know the best ways for you to regain alertness, based on those long nights in your past that make you the person you are today. Don't be shy about using any technique that works for you until you get on the ground safely, and remember that not flying when you are exhausted is almost always the best option.

A night spent in a motel getting rest when you feel too tired to fly might bother your sensibilities, but 10 years from now, you will forget all about it. If you fall asleep on the flight home tonight and don't finish your flight safely, your family will never forget it. POPA

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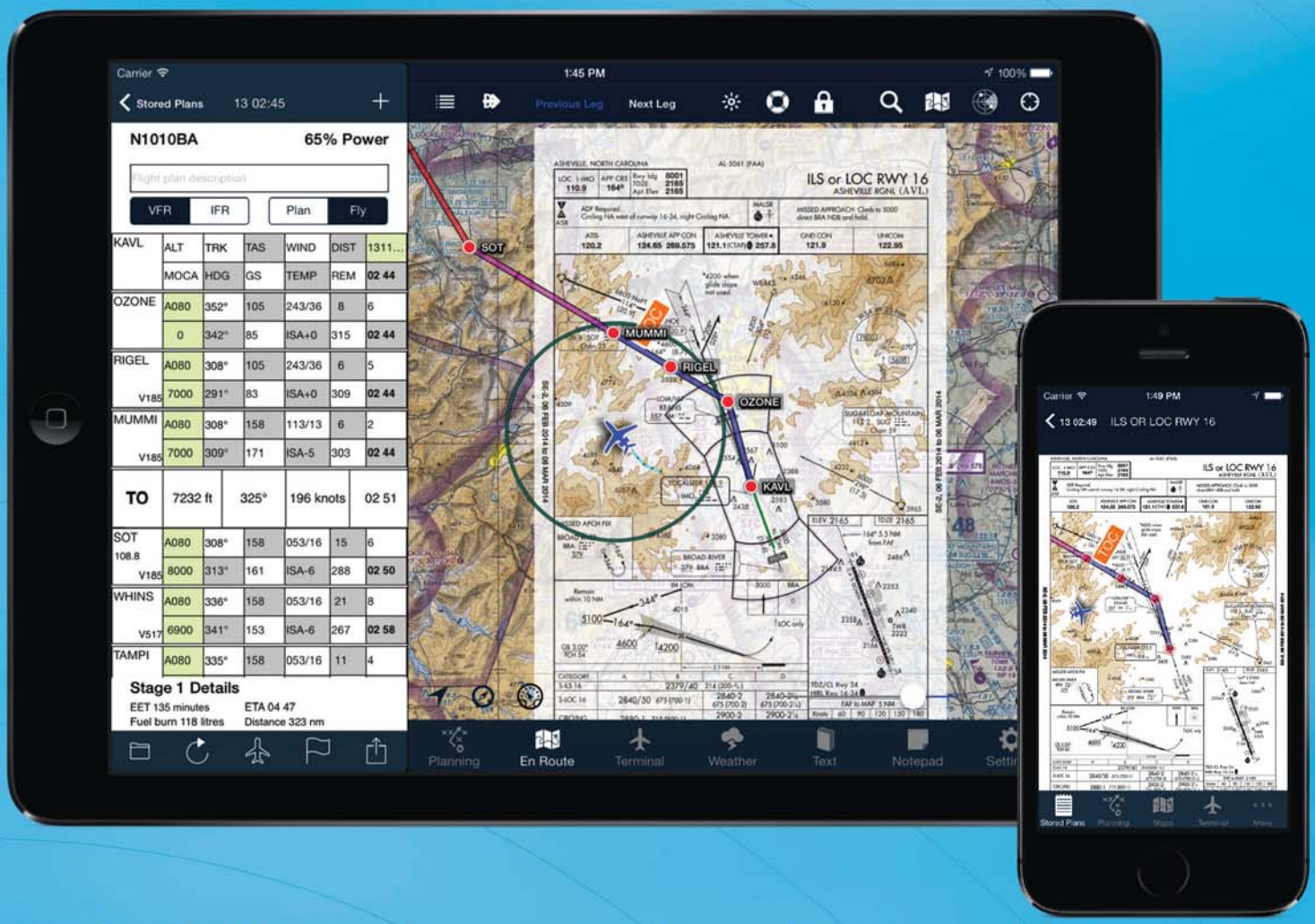

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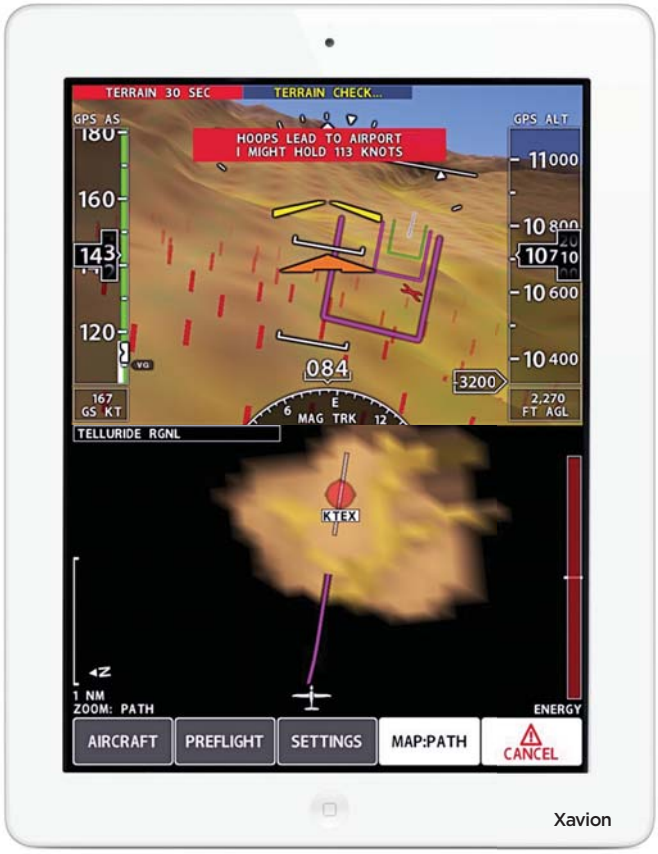


Xavion

FOR EMERGENCY USE ONLY… NOT!

THE BEST IPAD APPS (AND ACCESSORIES), SPRING 2014

By John D. Ruley

As pilots, we're taught to keep a continuous watch for things that may not be working – and to plan for what we'll do. During every BFR, at some point I can count on my instructor to pull the throttle, make me go through the engine-out checklist, and do at least a power-off approach. And it's good practice on long legs to look out the window and think to yourself, "What would I do if…"

For this issue, we're going to look at apps, accessories and, in one case, something most of us already have (a desktop computer and printer) that might just save you and your passengers some day.

Let's start with that nightmare scenario – what if the engine quits? It's not a huge risk for jet-prop pilots (the mean time between failures for the PT-6 is 346,000 hours) but it can and does happen. If you don't believe me, try a Google search of NTSB.gov for "engine failure" and your aircraft type.

If the engine quits in cruise, you'll probably have time to think through what to do (and run the checklist) since it takes awhile to glide down from the flight levels… But engines have a nasty habit of failing right after takeoff. And even if it happens in cruise, what if the weather's bad or it's night and you're flying over mountains? Wouldn't it be nice to have a tool that would give you immediate guidance to the nearest runway?

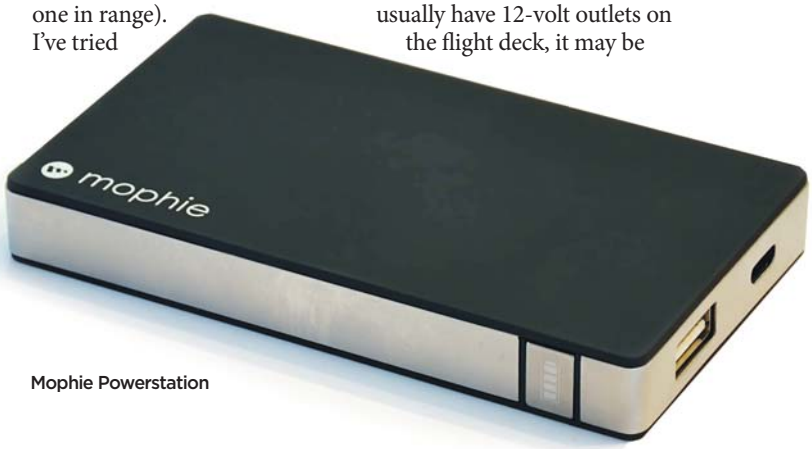
That's exactly what Xavion does. When I first saw it six months ago, I called it "hands-down, the most original app I've seen on an iPad," and it has only gotten better since then. Austin Meyer (the brains behind the popular X-Plane flight simulator) has improved it, among other things eliminating the obnoxious "jitter" the first version had if used on an iPad that wasn't solidly mounted.

Normally, Xavion functions as a portable PFD and Moving Map, working from its built-in world-wide database of runways, navaids, intersections, obstacles and terrain. Its real value, though, is what happens if you tap the red "emergency" button in the lower right corner of the display. Xavion immediately identifies the nearest airport in gliding range and displays "highway in the sky" fly-through boxes for a flight path tailored to the glide performance of your airplane. Fly through those boxes, and you will find yourself lined up perfectly on the nearest runway (it will warn you if there isn't one in range). I've tried it myself and can assure you it really works!

Xavion works best with an external GPS and attitude sensor, but it can get you down without them. It runs on both the iPad and iPhone. For $99.99, it has got to be one of the best bargains in safety equipment that you can buy! For more information (including a demo video that shows exactly how the app works), browse Xavion.com.

Of course, no iPad app can help you if you run out of battery power – and that can be a real problem for jet-prop pilots since turbine airplanes usually don't have a 12-volt outlet on the flight deck. You may have an inverter and 110-volt outlet in the passenger cabin, but that's not much help if you're alone. A friend (and fellow pilot) put me on to a handy solution: The $79 Mophie Powerstation. It's a self-contained external battery with a 4000 milli-amp-hour (mAh) capacity. That's not quite enough to fully charge a dead iPad, but it will get you about 80 percent of the way there – more than enough to finish even the longest of legs. You can charge it on the ground (or in the air if you do have an inverter in the cabin) and connect it to the iPad using a standard USB cable. You can buy one at any Apple store. For more information, browse Mophie.com/shop/ipad.

And while turboprops don't usually have 12-volt outlets on the flight deck, it may be



Mophie Powerstation

Dual Port Tech&Go

worth carrying a 12-volt USB charger anyway – because it will work in a crew car. Most Walgreens stores carry them. The dual port Tech&Go version shown in our photo will set you back all of $10.

Even with a full charge, iPads sometimes fail – as I found out last year, while on a for-real instrument approach to Crescent City, Calif. (KCEC). I had just completed a procedure turn and was preparing to descend when my iPad decided to reset. Fortunately I was still in visual conditions. I was able to bring ForeFlight Pro back up and get the plate on screen before entering the clouds, but the experience made me cautious.

Since then I've made a point of carrying paper back- up approach plates whenever I expect to need them – and no, I am not paying an additional subscription fee. I print them off myself. Here's how:

Start whatever app you're using to view plates, bring up the approach you expect to get for your destination and take a screen grab by pressing both the iPad's sleep/wake button (on the upper right edge) and home button (on the lower bezel) simultaneously. The display will blink, and you'll hear a camera shutter sound. Repeat that for all the plates you need (other approaches at your intended destination – since ATC doesn't always give us what we expect – and at your alternate and any SIDs/STARs you may need).

When you finish, use the sync cable to connect your iPad with any Windows-based desktop or notebook computer – it doesn't have to be the one you usually use. Click on the Start menu's Computer item to open the Computer window. At the bottom you'll find an iPad icon. Double click that and you'll get a new window with an Internal Storage icon. Double click to open, and you'll find a DCIM folder, and when you double-click that you'll find one or more sub-folders. You'll have to open each of those in turn to find the one that contains screen grabs – but once you do, scroll to the end and you'll find the plates you just grabbed. Select all the ones you want to print (an easy way to do that is to hold down the left mouse button and drag a selection box).

You'll have to copy the pictures before you can print them – so right click on the plates you selected and select Copy from the pop-up menu. Then open the Pictures window from the Start menu, right click between any pictures already there, and click Paste. You should now see the plates in the Pictures menu.

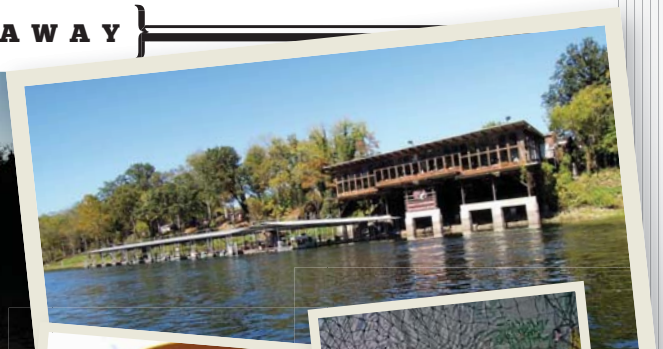
Now it's time to print – select all the plates (exactly as you did when copying them from your iPad), right click and select Print. A "How do you want to Print your Pictures" dialog box will appear. The 5x7-inch option prints two plates on each page in almost exactly the size of standard plates.

Happy Landings! –JDR

John D. Ruley is an instrument-rated pilot, freelance writer and recent graduate of the University of North Dakota Space Studies graduate program (Space.edu). He's also a volunteer pilot with LigaInternational.org, which operates medical missions in northwest Mexico, and Angel Flight West (AngelFlight.org), which offers free air transportation to medical patients. You can reach him by email to jruley@ainet.com.

WEEKENDERS

GOTTA GET AWAY



WHEN 'FLY' MEANS FISHING, HEAD FOR GASTON'S

BY MICHELLE CARTER

Looking for a spot to mesh your love of flying with your passion for fly-fishing? Gaston's White River Resort in Lakeview, Ark., would be hard to beat.

Program 3M0 (Three Mike Zero) into your GPS and prepare to set down on a 3,200-foot strip of neatly manicured Bermuda grass alongside the White River in north central Arkansas (Kansas City sectional). Taxi your plane into one of the free tie-downs, grab your fishing kit and stroll in to the Registration Desk at Gaston's. AvGas (but no JetA) will be waiting when you're ready to leave.

Al Gaston founded the resort in 1958 with 20 acres of river frontage, six cabins and six boats. Now under the direction of Jim, Al's son, the resort covers more than 400 acres with two miles of river frontage, with 79 cottages, ranging from two double beds and a bathroom to a two-story bungalow with 10 private bedrooms. The six boats now number more than 70, tied up at a huge state-of-the-art dock. Toss in a restaurant, conference lodge, private club, gift shop, tennis court, playground, swimming pool, duck pond, game room and two nature trails in case the trout-fishing isn't enough.

But if the fishing IS enough, shake hands with Frank Saksa, one of the most knowledgeable fishing guides on the White River. In his Fly Fishing School (with dates ranging from April through November), you'll get two days of personal instruction on using your fly rod, selection of flies, Frank's successful casting methods, and strategies for finding the best holes along the White or any other waterway. Bring your own chest-high waders!

Once you're ready for prime time, it's worth reserving the time of one of Gaston's river guides, such as 34-year veteran Red Adkerson who grew up on the river.

Sitting just below the electricity-producing Bull Shoals Dam, "the river can be treacherous," Adkerson was quoted in the Arkansas Democrat-Gazette. "Up to eight generators could be running. It helps to know the river. Anchor fishing in currents can cause a boat to capsize."

It's not unusual to reach your limit (four Rainbows per person) in just a few hours of float-fishing after sleeping in to a comfortable start at 8 or so. Once you've got your fish, the guides will clean them (surely, that's worth the cost alone!) and arrange for them to be flash-frozen to take home. Or you can grill them in your cottage kitchen or have the restaurant prepare them to your taste.

Should someone in your party not share your passion for fly-fishing, Gaston's is practically a wildlife sanctuary within the Bull Shoals-White River State Park. You can drop in to the Visitor Center to learn the history of the Ozark "johnboat" or head out on the Gaston Wildflower Meadow trail which competes with Gaston's own peacocks, guineas, pheasant and domestic geese for attention.

Oh, and all those cabins — they're all pink! "My father painted his cottages pink," Gaston told the Democrat-Gazette, "and each time I built a new cottage, I didn't have enough money to paint them all a different color. I call it a family tradition."

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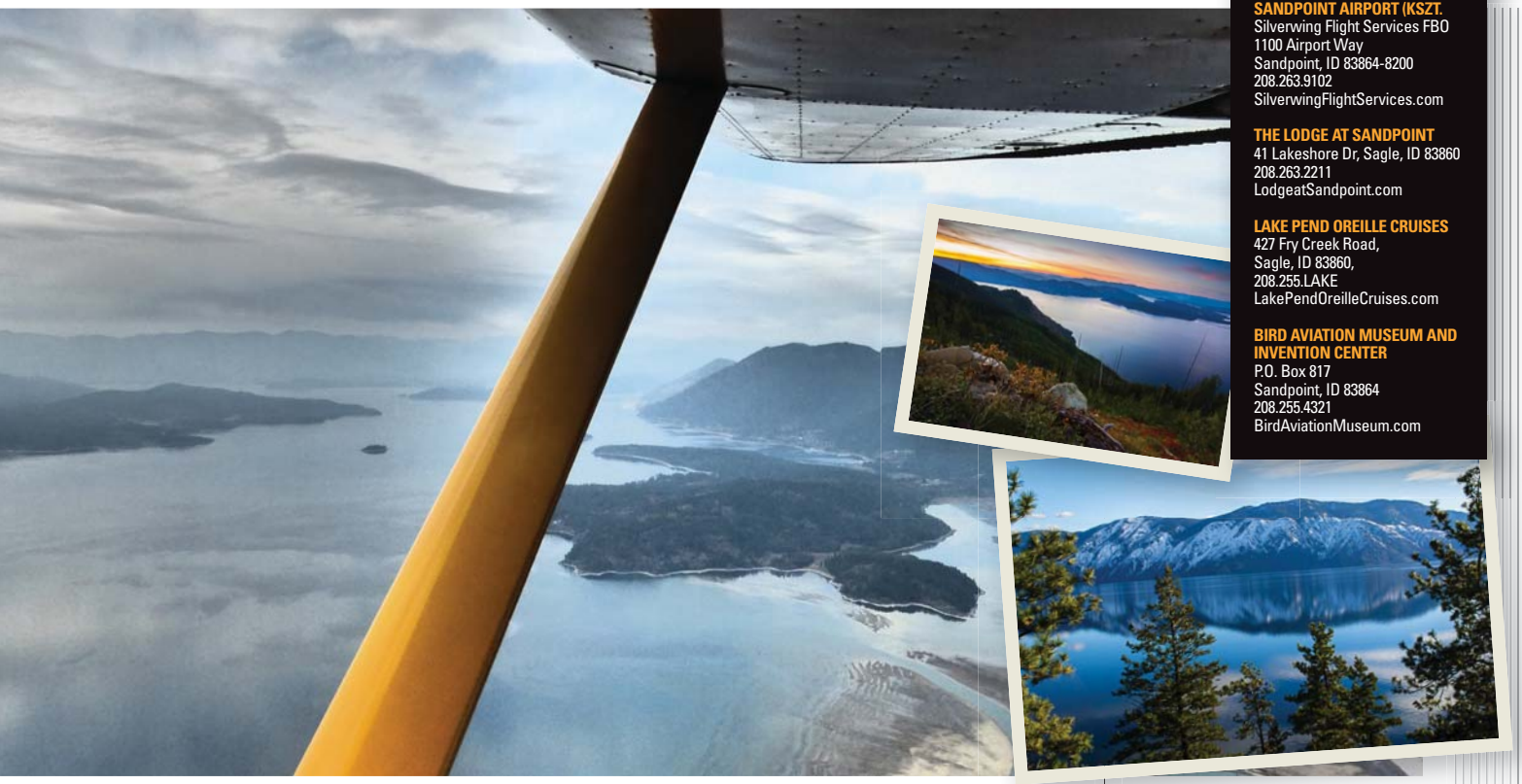
Wings of Rescue is a 501c3 volunteer pilot organization that flies once abandoned and discarded pets to rescue organizations and humane societies where they will find new homes instead of being euthanized in the "shelters."

6 million—Number of adoptable cats and dogs entering shelters each year
3 million—Number cats and dogs adopted from shelters each year
3 million—Number of healthy adoptable cats and dogs euthanized in shelters each year
6,500—Number of animals saved by Wings of Rescue so far.

WINGS OF RESCUE

How many can you save?

Please contact Yehuda Netanel, Founder of Wings of Rescue Inc.
yehuda@wingsofrescue.org



IF TOU GO...

SANDPOINT AIRPORT (KSZT.
Silverwing Flight Services FBO
1100 Airport Way
Sandpoint, ID 83864-8200
208.263.9102
SilverwingFlightServices.com

THE LODGE AT SANDPOINT
41 Lakeshore Dr, Sagle, ID 83860
208.263.2211
LodgeatSandpoint.com

LAKE PEND OREILLE CRUISES
427 Fry Creek Road,
Sagle, ID 83860,
208.255.LAKE
LakePendOreilleCruises.com

BIRD AVIATION MUSEUM AND INVENTION CENTER
P.O. Box 817
Sandpoint, ID 83864
208.255.4321
BirdAviationMuseum.com

SCENIC WONDERS OF IDAHO — WITHOUT THE ANGST!

BY MICHELLE CARTER • PHOTOS BY AARON THEISSEN AND LINDA MITCHELL

Idaho is deliciously replete with hidden wilderness spots that can only be reached by air with meticulous planning and polished mountain-flying and soft-field landing skills. Books and websites are filled with the wonders of flying around secret corners of the Gem State.

But one of the most spectacular Idaho settings in the northern part of the state is easily accessible and very hard to miss — Lake Pend Orielle, Idaho's largest lake, the second largest body of water west of the Mississippi and the fifth deepest in the U.S. So deep, in fact, that the Navy tests submarines in its pitch-black depths!

You can enjoy the wonders of Pend Orielle (pronounced pond-o-ray) from the comforts of the paved, 5,000-foot runway at Sandpoint Airport (KSZT) where Silverwing Flight Services FBO offers Jet A and AvGas and hangars as well as tie-downs. When you're ready to tuck in for the night, you can skip the tent or the dripping sleeping bag under the wing of your plane and settle in at The Lodge at Sandpoint on the lakefront for the night(s).

This magnificent lake, with 111 miles of shoreline, was named Kullyspel Lake, by a North West Company fur agent after the Kalispel Indians who lived there. Likely it was one of his French traveling companions who gave it the name that has endured — Pend d'Oreille, which means "ear pendant" or earring! (The "d'" has been lost to history.)

The lake spills into the Pend Orielle River, which, to this day, continues to host annual gatherings of Kalispel, Kootenai and other tribes who have held horse races, played traditional games and kept their culture alive on its banks.

But when you go, you'll want to make some important connections: Check in with Bird Aviation Museum and Invention Center, which showcases inventor Forrest Bird's collection of aviation memorabilia; the Quest Aircraft Co., which produces the Kodiak, a specialty 10-seat turbo-prop STOL aircraft designed to operate in back-country or Third World environments; and Lake Pend Orielle Cruises.

Contact the Bird Museum to see if you can land on Dr. Bird's private runway in Sagle, Idaho, to see the museum's collection of restored vintage flying aircraft and the inventions of Dr. Bird, who pioneered the medical respiratory industry.

Linda Mitchell, who took many of the photos accompanying this article (and serves as an amateur historian of the lake), is co-owner of the cruise company.

"Two of our captains are General Aviation pilots and a third was a plane mechanic in the Air Force, so we definitely have a connection to aviation," Mitchell said. They specialize in group fly-ins, and sunset dinner cruises are the highlights of those events.

And if you're particularly lucky out on the lake as the daylight sinks away, you might catch a glimpse of one particular denizen of Lake Pend Orielle, a deep-water creature not unlike the Loch Ness Monster, known locally as the Pend Oreille Paddler. Don't you think the Pend Orielle Prowler would be more ominous (and still appropriately alliterative)? Actually, the various sightings could be giant sturgeon, which historically have reached lengths of 12 feet and more.

But, as they say, doubts do linger.

"LOAD 'EM UP"

DO YOU EVER CARRY CARGO? ARE YOU SURE? AND WHAT ABOUT THOSE DOGS? By Lance Toland

The PC-12 cargo door opens operators up to an interesting array of risk other aircraft in the class have never ever thought of: Assuming all part 91 operations, are you covered to carry cargo? If so, what is defined as cargo and what is actually covered? A quick look at your policy will present you with a virtual minefield of definitions and exclusions that apply to whatever you might consider transporting.

Cargo legal liability is **not** usually part of a standard aircraft policy. It must be endorsed. In most cases, a policy extension or broad-form offerings will include cargo legal with some minimum limit. A deductible will apply, and an additional premium will be required to increase the actual cargo limit based on demonstrated need and a review of what you are thinking about carrying onboard.

Compare two different underwriters' cargo legal endorsements that modify their respective polices:

COMPANY A:

"The company will pay on behalf of the Insured all sums that the Insured becomes legally obligated to pay for the loss of, or Physical Damage to, the property of others (minus any applicable deductible) while such property is in the Insured's care, custody and control on a covered Aircraft, or while such property is in the Insured's care, custody and control on its airport premises, prior to loading on, or after unloading from, a covered Aircraft.

"This Coverage 11 does not apply to loss, damage or claim caused by:

- Loss of market or loss arising out of delay, whether or not the delay is caused by an occurrence,
- Consequential loss of any kind, Infidelity of the Insured or of the Insured's employees or agents,
- Wear, tear, deterioration, extremes of temperature or pressure, or any loss arising out of the perishable or hazardous nature of the property,
- Destruction of, or damage to, manuscripts, notes, checks, securities, accounts, bills, deeds, or any valuable papers in excess of their actual reproduction costs,
- Loss of, or damage to, any passenger's personal effects or baggage.

This insurance provided by Coverage 11 is secondary and excess insurance to any other insurance available to the insured covering the loss."

It should be noted that there are no exclusions under Company A's policy for animals.

COMPANY B:

"The company agrees to pay on behalf of the named insured those sums which the named insured shall become legally liable to pay (but limited to the named insured's liability under tariff document, airway bill of laden, or shipping receipt, if any) for direct physical damage or loss from external cause to cargo, caused by an occurrence, but only while in the care, custody and control of the named insured and only while onboard an aircraft insured by this policy or on an airport premise."

Once you have identified coverage in the policy, you will read further and find that many exclusions apply:

- Loss of use, loss of market, inherent vice, extremes of temperature or pressure or deterioration;
- Loss, damage or expense caused by, or resulting from, infidelity or dishonesty of any person in the employment of the insured;
- Loss in excess of actual cost of reconstruction of, reproducing or replacing destroyed or damaged manuscripts, notes, securities, accounts, bills, deeds, evidences of debt or other commercial papers or valuable documents of value; currency or money; property of the named insured;
- Baggage; bullion, gold, silver platinum or other precious alloy metals, furs, garments or garments trimmed with fur, jewelry, watches, precious or semi-precious stones or similar valuable property; live animals, birds, fish. Baggage means handbags, suitcases, valises, briefcases and other forms of baggage usually carried by travelers and the contents thereof.

So let's apply come common sense and ask a question: Are dogs covered when I carry them on my PC-12? Given the text of one of the above policies that giveth and then taketh away, it is hard to determine. And based on its strict policy wording and exclusions interpretation, the answer for Company B is no — dogs are not covered.

However, I broached the same question with several other underwriters recently and was surprised with their response. They agreed coverage was not afforded under their policy but, given that everyone loves dogs, they would probably make an exception and pay for any veterinary bills associated with an accident to show good faith. I would not apply the same metrics against the loss of gold. Everyone loves gold, but there would be no good faith shared on a gold loss.

As you can see, it takes a seasoned and experienced aviation-insurance representative to give you good advice on simple matters relating to your aviation insurance. And no two companies' policies read the same. In the case of live animals, you should check with your carrier and let them know you are transporting animals other than your pets, such as show dogs. Don't laugh, but we have seen prize pigmy ponies on PC-12s! Explain that one to underwriting.

As for other valuables, check in with your carrier. If you find yourself transporting fine art, which I do regularly, you may want to schedule the pieces as well. Play it safe and establish a dialog with your underwriter.

Did I mention the shipment of 5,000 live baby chicks or the Labrador who hopped on a float at the seaplane base? It goes on and on and on — and on. POPA

SIMCOM® TRAINING CENTERS Q&A

By Ted Otto

WINTER 2013 QUESTIONS AND ANSWERS

Question #1: When performing a Dry Motoring Run how long should the starter remain engaged before interrupting the starter?

Question #1 Answer: ***We should allow the starter to dry-motor for at least 15 seconds, during the dry-motor run, before interrupting the starter.***

Question #2: When should the STAB TRIM be set for takeoff to the GREEN DIAMOND instead of the green line?

Question #2 Answer: ***We should trim to the green diamond for take off when the center of gravity is 236 inches aft of the datum line.***

Question #3: What is the maximum ITT / maximum recommended ITT during climb?

Question #3 Answer: ***Max ITT for takeoff in 850 degrees for five minutes, 820 degrees after that; however, 780 degrees is recommended in the 47/E PC-12. Max ITT of 800 degrees for five minutes, 780 degrees after that is recommended for the Legacy PC-12.***

Question #4: What is the minimum recommended airspeed for holding in icing with residual ice on the airframe?

Question #4 Answer: ***Minimum speed for holding in ice is 145 to 175 knots, indicated airspeed.***

Question #5: What is the maximum flap extension limit during flight in icing conditions or with any visible ice accretion on the airframe.

Question #5 Answer: ***Flap extension speed in ice is the same as without ice, but we are limited to 15 degrees of flaps and 0 degrees of flaps if there is a boots de-ice failure.***

SPRING 2014 QUESTIONS

1. What does the Probes-Off CAS message mean?

2. What are the max demonstrated crosswind speeds?

3. What indications are we looking for during the boost pump test?

4. What is the procedure for a Pusher CAS message, or CAWS pusher caution, in flight?

PT6A OVERHAUL: AN OWNER/PILOT'S PERSPECTIVE

DO YOUR HOMEWORK, BE SKEPTICAL AND DON'T CUT CORNERS ■ By John Zimmerman

Overhaul is not a four-letter word, but it might as well be for many turbine airplane owners. The thought of spending nearly half a million dollars to rip apart your ever-reliable PT6A engine probably makes you nervous. Having just completed the process on our 2000 Pilatus PC-12, we can confirm that nervousness is warranted. In fact, a state of nervous paranoia may be just the right way to approach the whole process.

The following observations are from an experienced turboprop owner and private pilot — not a corporate pilot, a service center manager, or a flight department maintenance manager — so take it for what it's worth. Your mileage may vary, as they say. We were lucky to have the help of a professional pilot with maintenance experience who supervised our overhaul, but this article assumes not all owners have that good fortune. Our goal is not to complain or scare you (it all worked out in the end), but to offer some real-world tips on surviving the process.

PLANNING: INVEST YOUR TIME

First, you need to realize that a PT6A overhaul is a big deal, not a minor event. That may sound obvious, but it's important to appreciate that this is not just a little bit bigger than an annual. There are lots of places to get off track and many causes of disappointment. If your last overhaul was a Continental IO-550, it's time to adjust your expectations.

Next, allocate real time and effort in analyzing all the options and costs, planning the timing and process steps, and overseeing the project. You'll be tempted to rush through this phase — don't. As with any major financial transaction, read the fine print, get second opinions and be involved. Just as you should never take off in your PC-12 if you're unsure about the weather, do not sign up for an overhaul until you fully understand what you're getting into. If you have a question, ask it!

Keep good records, too, especially during the quoting process. Scope and pricing tend to change as time goes by (and rarely in your favor), so pay attention to how long quotes are valid for and double-check each new quote, estimate or invoice against the appropriate documents. Paperwork matters.

And take a pill — an overhaul will have its difficulties and surprises.

TIME AND MONEY: REAL ANSWERS

Let's tackle the big questions right away: how much and how long? The answers to these questions vary a lot, depending on how you operate your engine, where you fly and a little bit of luck. But don't believe the stories about a $250,000 overhaul; they are hiding in the same place you'll find free Jet A and guaranteed stock-market returns.

It's realistic to expect the total cost to be at least $400,000 and probably closer to $500,000 by the time you're all done. It's also realistic to expect the time to complete the full overhaul process to be close to three months. That doesn't mean your airplane will be down for three months (see the loaner option below), but that's how long it will be before you're flying your newly overhauled engine. Note that this cost experience assumes no major problems like new blades ($80,000 per set) or other disasters they will warn you about. In our case, this was an airplane flown regularly, operated at cool temperatures (695 to 705 ITT), by the same three pilots, and based in the Midwest away from sea air.

Beyond those round numbers, you should expect and formally budget for higher costs than the overhaul shop tells you at the beginning, and by 10 percent-20 percent minimum. The fine print in their quote or estimate will give them all kinds of room to go up in cost, and you really will have no idea whether it is justified or not. To be fair, there are a lot of unknowns for the shop and, until they crack the engine open, it's hard to know how much work is involved. The sooner you come to terms with this lack of certainty, the better.

These scary numbers send some owners looking for shortcuts and "hot deals," but unless you are some kind of professional, recognize that you are alone at sea in hostile waters. This is no time to get cheap or experiment with new people in your maintenance life. In a Pilatus, you have one engine, and it is your ass. Stick to proven service centers where you have a relationship. Trust will be required or you will jump out a window before this is over. Most reputable


HARTZELL

shops have a warranty, so make sure you've read it and understood it as well.

LOANER OR NOT?

Besides the cost in money, you must plan for a significant cost in time. Decide whether to get a loaner engine for two months while your engine is being overhauled. If you fly 60 hours with the loaner engine, assume this decision costs an additional $25,000, including an extra remove/replace for the engine. This is offset by any chartering you would choose to do if your airplane was otherwise down for the entire overhaul time. Only you know if the math works for your operation.

We believe the loaner engine is a good decision and a relatively small 5 percent increase on a $400,000-$500,000 project. Most importantly, you will make better, more patient decisions at the end of the project if you have a loaner engine. The incentive will be to get a quality job, instead of a rush job because you want your airplane back in the air. We didn't regret getting one.

However, even with a loaner, you should remember that at the end of the overhaul when your engine is ready for reinstallation, you will need to put down the airplane for two weeks while certain parts are taken off and sent out for overhaul. This can include the oil cooler, generator 2, fuel pump, engine mounts and more. The loaner helps a lot, but you will still lose the airplane for this final period. Do plan to do these other accessory parts at this time and remember this list may add as much as 5 percent to the shop overhaul cost.

THE OVERHAUL ITSELF

The reality is you will almost certainly get good maintenance work in the end, but you will also probably have some frustration with the financial and communication skills in this business. Take a second pill.

If you have a good service center with people you trust, listen to them; if you don't, keep looking! They will know best which actual overhaul shop to use. Insist that you are the customer and expect the service center to represent your interests to Pratt & Whitney, Dallas Airmotive, or whoever does the work. Some service centers have a retained expert who will go to the overhaul shop and evaluate what is recommended. Favor a service center that has this feature because it adds expertise you almost certainly don't have.

Be adamant that you are the customer of the service center and the shop is their sub. But it's still a good idea to get the contact information for the overhaul shop manager who will be in charge of your engine for a few months. You will probably have to communicate directly with him during the process.

If at all possible, tour the overhaul shop while your engine is there. You will have no idea what you are looking at and, if you are not frightened when you see your engine all apart in a basket, you just do not understand human frailty. But you will learn some things, set an expectation in the shop, and pick up a few unfiltered truths that may be helpful later. Also, it is interesting and a good learning experience.

Once the engine is at the overhaul shop and has been inspected, the final costs become clearer. Insist that the original quote or estimate be broken out in detail and that the final "needs estimate" be presented on the same page and in the same form — in understandable English. The shops hate this and don't do it well, but it is the only way an amateur can drill down and understand the problems, surprises and costs.

Also request a detailed report with photos and prices of the damaged parts to help better understand why the part is being scrapped or overhauled. You may not know exactly what you are looking at, but it's satisfying. Your $350,000 estimate can quickly become a $450,000 overhaul at this point, and it's important to understand why.

Finally, consider what taxes are involved. In a growing number of situations, you may not have to pay sales tax. On a big job like this, an extra 5 percent to 8 percent can really add up.

PICKING UP THE AIRPLANE

When your engine is back from the overhaul shop and your service center has installed it on your airplane again, it's finally time to get your pride and joy. Time to exhale, right? Not even close. Just like landing a tail-dragger, it's not over until the airplane is back home in the hangar, and the door is closed.

When the service center thinks the airplane is ready, ask them to find a competent pilot to fly the airplane before you go to pick it up. Something will need an adjustment at best, and it's better that they discover and fix it. You do not want to stand around for a day, or worse, fly it home and have to come back. That creates frustration and all kinds of pressure to cut corners.

Also, do not be surprised if you are asked to pay for everything before you take the airplane. That means you need to pre-arrange a wire transfer for a big number. And yes, this is before you even know it works. The shop demands that you trust them to decide what needs to be done, but they do not trust you to pay — just one more reason to use a qualified service center that you know.

FINAL THOUGHTS

If any of the above observations and opinions are wrong (and some may be), one most definitely is not: You must trust whom you do business with or find someone you do trust. Want to scare yourself? Lift the cowl on your airplane and stare at that PT6A for five minutes. There are many parts and systems in there that all must be worked on and put back together again correctly or, frankly, you might die. Trust is the key ingredient you must have regarding work and money.

In summary, this is a complicated and expensive project. View this as a financial and management problem, not a maintenance one. You aren't turning the wrench, and most of us wouldn't know what to do if we were. Focus on the estimates, the communications with your service center and the schedule. Be a pessimist and a skeptic; keep asking your service center, "what else?" If it turns out that this paranoia is unwarranted when it is all over, celebrate! Go buy yourself a new GPS or a Stratus and take a trip to the Caribbean with the newfound money.

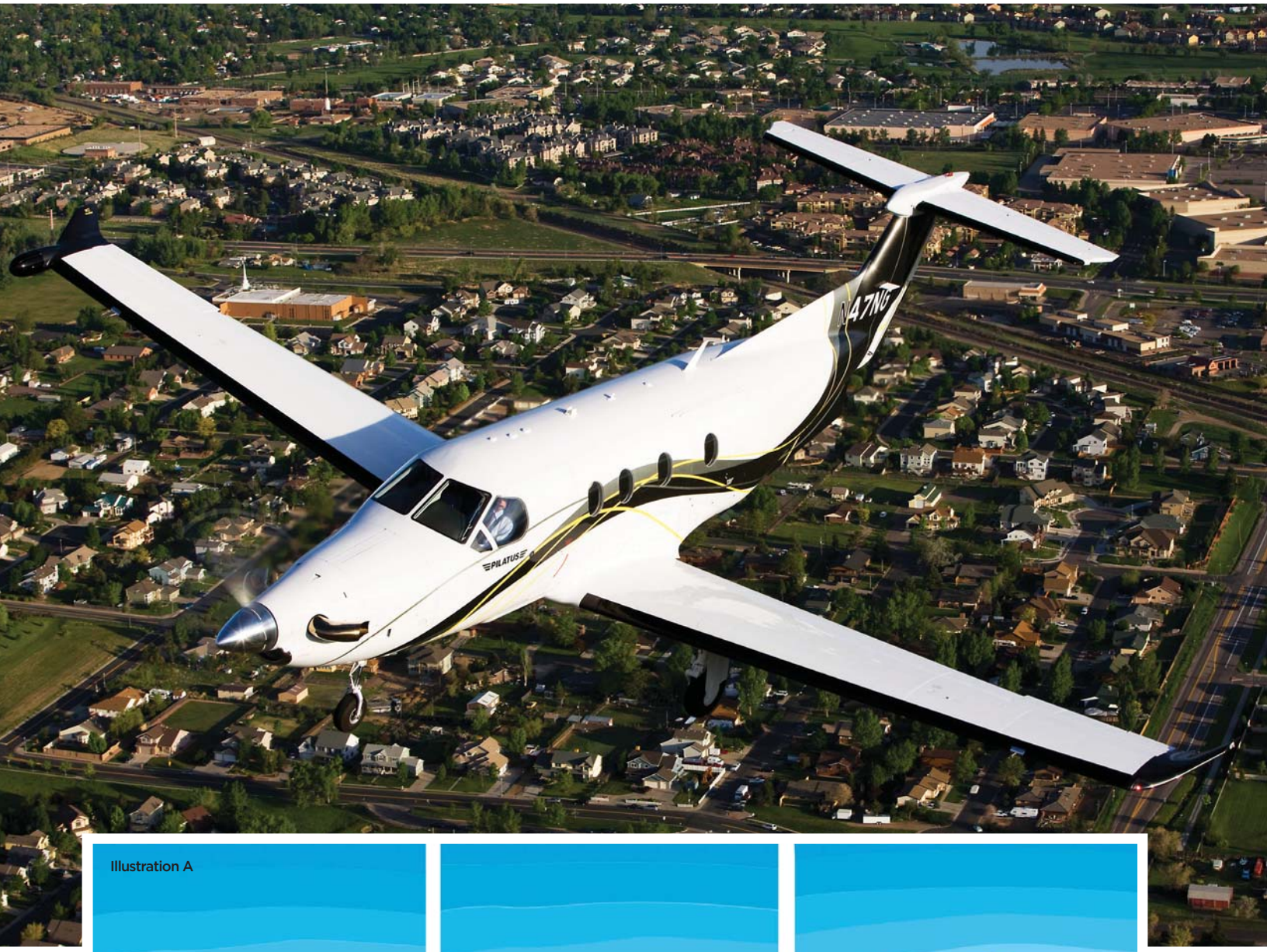
If you are like most of us owner/pilots, you are done for 10 years, more than the time until your next colonoscopy, which, by the way, is a similar experience! This may be why so many choose to buy a newer plane instead paying for an overhaul, but it can be done. Good luck.

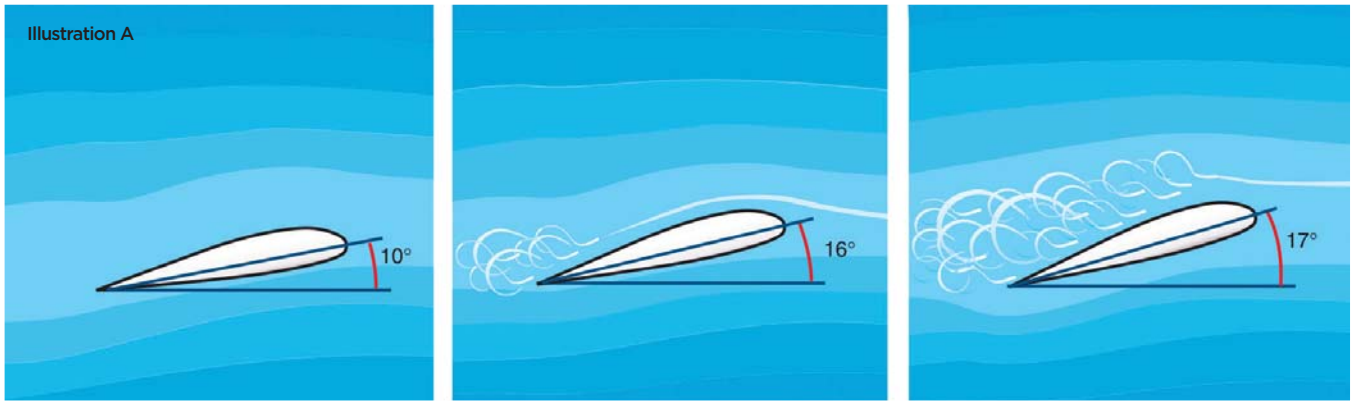
THE TRUTH ABOUT STALLS

By Thomas P. Turner

"Describe the most common scenario for stall-related crashes." When I ask this in presentations, invariably the first response is "the base-to-final turn." Takeoff, balked landing, missed approach and circling instrument approach all make the list — but the audience always says a power-off stall during the base-to-final turn is the most common type of accidental stall.

Always one to base my educational message on data, I went to the mishap record to find out what *actually* causes stalls that have led to crashes. In the case of the PC-12, what I found — the truth about stalls — is somewhat surprising.





CRITICAL ANGLE OF ATTACK

We are taught that stalling is a function of flying a particular speed. Intellectually, we know that stalls are "truly" a function of angle of attack (AoA). The disconnect stems from the way stalls are presented in the aircraft handbook and training, almost universally in terms of indicated airspeed.

Another reason we commonly misunderstand stalls is that the diagrams in most training materials look as though stalls always occur at a very nose-high attitude. This is the diagram from the Federal Aviation Administration's Airplane Flying Handbook: ***(See Illustration A)*** This illustrates that, in most General Aviation airfoil designs, the stall begins at about 17 -degree angle of attack, the so-called critical angle of attack. But the picture makes it seem as if the airplane must be very nose-high to achieve this critical angle. Yet when stalls truly occur, they often do so at lower pitch attitudes. If a stall occurs during the base-to-final turn or on final approach, it seems very unlikely

the nose would be above the horizon at all.

To better understand how an airplane pointed down can reach the critical angle of attack, I tilted the FAA diagram to correspond to a final approach descent. I then superimposed a stylized airplane around the wing pictures. My modified diagram clearly shows how an airplane may stall during final approach or the beginning of a balked landing/missed approach, with the nose pointed far further down than the FAA diagram suggests. ***(See Illustration B)***

This is what happens when the pilot attempts to "stretch" the glide instead of adding power when landing short of the runway. The illustration also shows what happens to angle of attack if the pilot begins a go-around or missed approach by pulling up before adding power. In either case, critical angle of attack may be reached while the airplane's nose is still pointed below the horizon.

Similarly, an aggressive pitch-up on takeoff can result in a high angle of attack without attaining the unrealistically high pitch attitudes we see in power-on stalls in the manner we usually practice. If the airplane is heavy and/or the density altitude is high, reduced thrust-to-weight ratio makes the airplane even less spritely in climb. So a little more pitch up means even greater angle of attack.

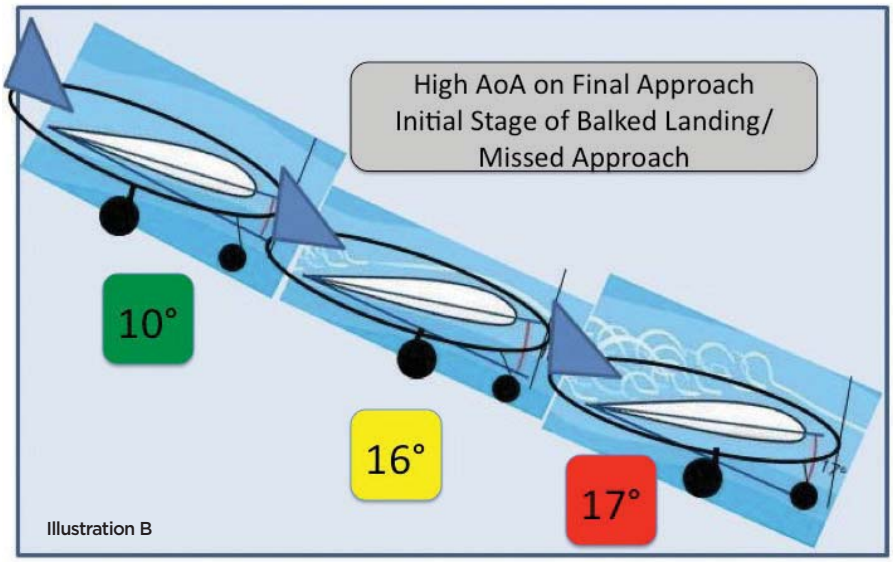


Illustration B

If the airplane isn't climbing as well as it does under more "normal" circumstances, the pilot's reaction may be to try to force it to climb by raising the nose even higher. I modified the diagram a second way to

REPRESENTATIVE PC-12 STALL-RELATED CRASHES

THE AIRPLANE WAS ON AN ILS APPROACH WHEN IT SPUN IN A NOSE-DOWN, NEAR-VERTICAL ATTITUDE BEFORE IT COLLIDED WITH THE GROUND ABOUT THREE MILES FROM THE RUNWAY. Radar disclosed that the pilot had significant excursions above and below the glide path on the approach, as well as large variations in airspeed. Other pilots reported icing conditions in clouds near the airport. Post-accident inspection discovered no evidence of pre-impact anomalies. Analysis suggests the pilot had not switched to the proper instrument approach (V-LOC) mode to allow the autopilot to lock onto the ILS.

NTSB probable cause: The pilot's failure to maintain sufficient airspeed to avoid a stall during an instrument final approach to land, which resulted in an inadvertent stall/spin. Factors associated with the accident are the inadvertent stall/spin, the pilot's failure to follow procedures/directives, and clouds.

WITNESSES SAID THE FLIGHT INSTRUCTOR TRANSMITTED THE INTENTION OF PRACTICING A LOSS OF ENGINE POWER AFTER TAKEOFF AND TURNING 180 DEGREES TO RETURN TO THE AIRPORT. The airplane pitched up 30 degrees while simultaneously banking hard to the right in an uncoordinated manner. As the airplane rolled to the right, the nose yawed down to nearly 45 degrees below the horizon. Subsequently, the wings rolled level, but the aircraft was still pitched nose-down. The right wing tip and engine impacted terrain, and a fire consumed the airplane. No pre-impact anomalies that might have affected the airplane's performance were identified. The center of gravity was determined to be approximately one inch forward of the forward limit. NTSB probable cause: The flight instructor's failure to maintain an adequate airspeed while maneuvering, which led to an inadvertent stall.

THE PILOT FILED FOR A 0700 DEPARTURE. He and his passenger arrived at the airport approximately 0800 and requested that the airplane be fueled. The airplane was pulled from its heated hangar into heavy snowfall and fueled at 0917. As the airplane sat outside, wet slushy snow accumulated on the airplane. The FBO manager suggested that the airplane be de-iced, but the pilot declined. The airplane was then pulled out to the taxiway to prevent it from becoming stuck in the snow. At 0939, approximately 22 minutes after the airplane was pulled out if its hangar, the pilot departed with a visibility of three-quarters of a mile in snow with a four-knot direct tailwind. The pilot then made a right turn, continuing into an ever-tightening right turn until it impacted the ground upside down about one mile from the runway. Examination revealed no anomalies that would have contributed to loss of control. The airplane's POH and AFM contain the following limitation: "The aircraft must be clear of all deposits of snow, ice and frost adhering to the lifting surfaces immediately prior to takeoff." NTSB probable cause: The pilot's loss of control due to snow/ice contamination on the airplane's lifting surfaces as a result of his decision not to de-ice the airplane before departure.

show takeoff and initial climb. It illustrates that the nose does not need to be radically nose-up to reach the critical angle of attack, even at full power.

With a better understanding of how stalls can occur, let's look at what has actually happened in the PC-12 series of aircraft. In each case, I've reviewed accidents investigated by the U.S. National Transportation Safety Board for the model's entire history. ***(See Illustration C)***

PC-12 STALLS

Six crashes of PC-12s have been attributed to aerodynamic stalls. Four of those were fatal. Two of the reported stall-related crashes occurred on takeoff or initial climb.

Four of the PC-12 stalls were the type of stall we generally expect, during landing. One of those was on three-mile final inbound on an instrument approach in IMC, the other three on short final just prior to or over the runway. Surprisingly, the base-to-final stall crash, the type we all think about and (hopefully) guard against, has never occurred in a PC-12 to date. ***(See Illustration D)***

Illustration C

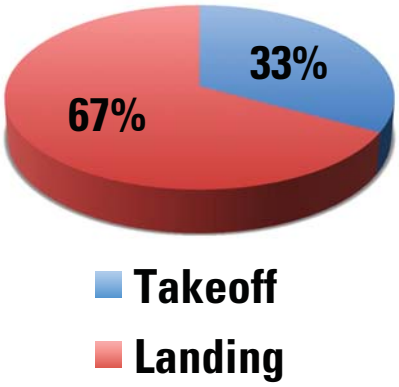
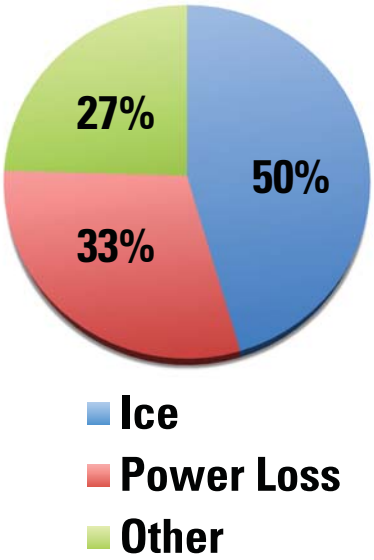


Illustration D



CONTRIBUTING FACTORS

Frequently, contributing factors do conspire to bring a flight to grief. This is certainly true in the Pilatus stall record. For example, airframe ice played a role in half of the reported PC-12 stall crashes, one on takeoff, two on landing. Certification for flight in icing conditions (FIKI or Flight in Known Ice) is subject to real-world limitations on the type or rate of ice accumulation the equipment can handle. It's vital to remove ice and snow before takeoff and to avoid low-speed operations (like approach

and landing) until ice accumulated in flight has been removed. ***(See Illustration E)***

Two of the stalls (one takeoff, one landing) took place during dual flight instruction. In one, the pilot radioed an intention to simulate engine failure on takeoff and a return to land. The airplane fatally stalled in this "impossible turn," wild ride. In another event, an FAA pilot examiner simulated an engine failure near an airport, and the pilot stalled the airplane in an attempt to make it to the runway.

THE TRUTH ABOUT STALLS

What can we learn from the PC-12 stall-related crash record?

- Two-thirds of all stalls happened on short final — but none in the base-to-final turn.
- Half of PC-12 stall crashes involved airframe ice.
- Engine failures themselves are not fatal. Stalling the airplane while attempting to land out of an engine failure is what can kill, as demonstrated by the instructional/checkride events.

Here's how you can mitigate the risks of a stall in your PC-12:

- With a qualified instructor, practice regularly to maintain a "feel" for stalls, to be more likely to detect impending stalls during distracting situations.
- If you find yourself low on glide path, add power to reduce the rate of descent, instead of raising the nose to try to "stretch" your glide.
- Add power before raising the nose during a balked landing or missed approach. Although no PC-12 stalls took place "on the go," this is a common scenario in similar airplanes.
- Respect the icing limitations of even "known-ice" certified airplanes.
- Employ precise power and pitch attitude control to avoid high angle of attack conditions.
- Use slightly lower pitch-attitude targets at high airplane weights and/or high density altitudes. POPA

Illustration E