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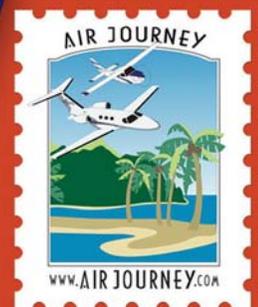


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## LIFE AS A PILOT



**T**he board of POPA at a recent meeting thought it a good idea if each of us wrote an article about their life as a pilot, more specifically why we fly, what have we learned, and why POPA is important to us. As President, the short straw went to me...so here is my story.

My fascination with aviation wasn't for the speed, or flying upside-down cheating death, but rather the beauty of life at 3,000 ft, the challenge of learning something new, and the incredible utility of an aircraft. In other words, you get to places easier and faster...and its way more fun.

I have landed in 45 states and 11 countries in my PC-12. Nearly all our family vacations have been in the plane. My top flights have been from Oregon to Anchorage, AK via Juneau on the most splendiferous day I could ever have hoped for! I felt I could reach out and touch the glaciers, mountains and whales (and I was at 14,500 ft!), the beauty of flying over the high desert of Oregon into the intense green of the Willamette Valley, and finally close to home an evening decent on a clear winter night into the NYC Class B airspace on my way back to HPN. You can see the lights of every street in every borough laid out before you glistening in the cold air. It's a privilege to be able to have witnessed this so many times. I call it my God Bless America Flight. It never gets old!

I have never used my plane for any business flights, which I am sure astonishes the reader but it never fit my profile. But, nearly 75% of my hours are utilized doing something which I have dedicated a great part to the last ten years to, and that is volunteer flying.

About 4 years ago, I co-founded and Chair a Volunteer Pilot Organization named Patient Airlift Services or PALS. We have grown mightily and now have nearly 300 active volunteer pilots flying from Maine to Virginia, Cape Cod to Cincinnati, and recently arranged our 5,000th flight. The utility of helping others in a Pilatus outweighs all the other great things I can say about the plane. Whether flying humanitarian flights to Haiti, to baseball games with our Wounded Heroes from Walter Reed through our program with MLB.com, or a child for life saving treatments in a far away city, nothing beats the feeling of using one's unique skills and aircraft to help better a life. If you have done one of these flights, you know what I mean, if you haven't, I urge you to give it a try.

As far as some of the things I have learned, or philosophies I fly by I would list the following:

- I try to approach every pre-flight with the attitude of "what did the plane do to try and hurt me since the last time I saw it".
- I flight plan to land with 650 lbs. of fuel or more, I will not land below 500. I don't want to spend all my flight worrying about fuel and the plane can go a long way on 2050 lbs
- I strive to fly by the POH. Numerous errors contributed to its writing. I am content to do things the way experienced hands suggest, before going off and trying to prove them wrong. This includes flying approaches as written.

- Any time I am in visible moisture below +10c, I put on all ice protection. It is so much easier than looking out the window every two minutes and running the risk of being distracted.
- Whenever I get nervous, I slow the plane down. It's amazing how the sound of the reduced power relaxes the mind.
- I fly approaches out loud (2,000 for 640 e.g.).
- I want at least two rock solid alternate routes when a flight is planned into ice, convective activity or low instrument approaches. I don't want to be in the air negotiating with myself.
- I am always amazed at how many more mistakes I make (simple ones usually, but mistakes nonetheless) when I haven't flown for two weeks or more. I almost always fly within 10 days of my last flight.
- I hand fly under 5,000 ft AGL and whenever I don't have passengers as much as I can.
- I don't mess around with maintenance. If it isn't working, I get it fixed.
- I try and train with different operators in order to get their insight on owning and operating the plane, rather than sticking with one training program.
- And of course, I always go to the annual POPA Operations and Safety Conference. There is no better way to stay current and motivated than to be around those who operate the PC12 in every environment there is. I always come away learning something that helps me be a safer pilot.

I believe a strong POPA contributes to an ever improving pilot experience in terms of safety, reliability and economy. It's the reason I eagerly joined the board.

I look forward to many more years of safe, enjoyable flying, and to seeing you at the convention!

A handwritten signature in black ink that reads "Joe Howley". The signature is fluid and cursive, with a large initial "J" and "H".

Joe Howley  
POPA President



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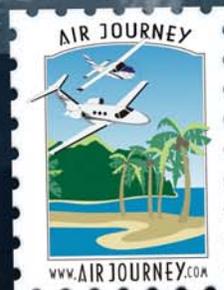
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# NEW & NOTABLE

## NO MORE BAD HAIR DAYS

Few things can make a long cross-country flight more miserable than the pain of a poorly fitting headset clamped across the top of your head. And then there's the way your hair looks after being "headband-ized" for hours on end. Enter Aerous VX3. This new aviation headset installs customized earpieces into the pilot's ear, giving him/her the same high quality sound demanded by the snootiest audiophiles you can find. Communications with ATC are crystal clear, and onboard audio files from your MP3 are like nothing you've heard before. Check it out at [Jhaudio.com](http://Jhaudio.com).



## PANORAMIC POSSIBILITIES

If you've ever marveled at the beautiful images the Mars Rovers have sent back to earth, then you have an idea just how unique and defining high-resolution panoramic photos can be. The same technology (developed in collaboration with NASA and Carnegie Mellon University) that brought us pictures from the surface of Mars is now available to all of us via the GigaPan EPIC Pro, a revolutionary robotic camera mount designed for DSLR (Digital Single Lens Reflex) cameras.

The GigaPan EPIC robotic mount empowers cameras to take hundreds, even thousands, of photos which are combined to create one highly detailed image with amazing depth and clarity. GigaPan Stitch software (included) blends all the photos seamlessly into one brilliant panorama. Learn more at [GigaPanSystems.com](http://GigaPanSystems.com).



## SHOW ME THE MOVIE

The coolest new gadget to come out may just be the Optoma Pico PK101 pocket projector. Plug the 4-inch gadget into your iPhone or iPod and project movies onto a wall or even the seatback in your airplane, even in daylight. Crisp images are available anywhere from 8 inches to 8 feet in front of the little projector. Plug in the speaker or headphones, and it's ACTION! Get all the info at [Optoma.co.uk/OptomaPico](http://Optoma.co.uk/OptomaPico).

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## All-in-One Jacket, Sleeping Bag, Raincoat and Tent!

Now you can be prepared for just about anything Mother Nature sends your way. The patent-pending JakPak incorporates a waterproof sleeping bag, minimally structured tent and insect netting into a comfortable jacket, creating an instant getaway from inclement weather. It is also the perfect addition to the emergency equipment you carry on your airplane.

The sleeping bag folds down from the back of the jacket. You then step in and zip it up at the side. The hood of the sleeping bag is pulled out from a pocket on the back of the jacket and that, in turn, is supported by metal tent rods. "Storm flaps" will keep out water, and netting will keep insects at bay. The sleeping bag also has room for extra clothing for additional warmth.

Weighing about 3 pounds, the JakPak is waterproof/breathable on the front side, and completely waterproof on the back, removing any worry you might have about staying dry, even when you're lying down.

The JakPak comes in a two-tone green and black/gray, or you can ask about custom colors. Get more information from their website, [JakPak.com](http://JakPak.com), or by calling 800.373.5593.



## BRING THE LUXURY ALONG

With the popularity boom of coffee products over the last decade, plenty of us just aren't comfortable facing the day without our espresso. Thank heavens for the Handpresso Wild Domepod. Add the ground coffee of your choice, hold the unit over your aircraft's demitasse (!), and you're in business. Start your brew at [Handpresso.com](http://Handpresso.com) or at 888.389.4123.

## TSA-Friendly is No Longer an Oxymoron

We all have to fly commercially from time to time and, of course, that always includes the fun of the security check. Now it's all a wee bit more palatable, thanks to the folks at CODi. Their new Phantom laptop case allows you to send your computer through the X-ray machine without having to take it out of the case. Grab the bag as it comes out the other end, and you're good to go. Well, after you put your shoes back on. Get the 411 at [CODi-inc.com](http://CODi-inc.com) or phone 800.263.4462.



## Dog Ears

If you're concerned enough about cockpit noise to wear a headset, imagine how your dog must feel. He/she has more sensitive hearing than you do. Enter Safe and Sound Pets, a Maryland-based company that dreamed and designed Mutt Muffs. This canine ear protection comes in five sizes, and dog owners report a high level of satisfaction. Mutt Muffs were specifically engineered to meet the contour of a dog's head to provide the best passive sound reduction possible. A dog's hearing is much more sensitive than ours. makes sense that if you are wearing hearing protection, so should your dog. See more at [MuttMuffs.com](http://MuttMuffs.com).

## Now That's Entertainment

If you're tired of lugging your laptop along on your flying adventures, or frustrated about trying to use your fat fingers to navigate the internet on your phone, here's a great new solution from Sony. The Dash can streamline your life using its Wi-Fi connectivity to deliver Gmail, Twitter and Facebook. More than 1,000 apps are currently available for the Dash, and more are being added every day. The new Dash is one of Sony's best new offerings! Get the 411 at [SonyStyle.com](http://SonyStyle.com) or dial toll-free, 877.865.7669.





### BENTGO CONTAINERS

Culinary-minded fliers will appreciate being able to pack and go with these stackable plastic food containers. Pack a great meal for those long flights! Inspired by Japanese bento boxes, the BPA-free plastic packs include two containers, a built-in cutlery set, and a sealing strap. They're safe for both microwaves and dishwashers.

**Bentgo.com**

### EYE-FI MEMORY CARD

Eye-Fi Mobi automatically transfers your photos and videos from your camera to your smartphone or tablet, no matter where you are. That's because Mobi creates its own Wi-Fi network. You take the pictures and then watch them appear on your mobile device to enjoy and share, instantly.

**Eyefi.com**



### BLACK AND BLUM SANDWICH ON BOARD

On first glance, this is merely a very attractive aluminum lunchbox. But it gets better: A chopping board inside means the owner can slice up extra sandwich fillings just before eating. It's an end to soggy sandwiches! **Black-Blum.com**



### EXOThERMIC CRYSTALLIZATION REUSABLE HAND WARMERS

If you are always cold in the plane, this is the item for you! The metallic pellet of this heat pack has a magical effect as it allows you to activate it in an instant, when you need it, anytime, anywhere, without a heat source! Majestyl heating pads contain sodium acetate and water. Just press the clicker inside, and the bag will get instant heat. The bag can be easily reused by boiling in hot water for about 10 minutes or until the crystals once again turn to liquid. Let it cool down and repeat the heating process the same as to begin with. **ThinkGeek.com**

### SANDISK WIRELESS MEDIA DRIVE

Ideal for long flights with family and friends, the Wireless Media Drive is the perfect pocket-sized entertainment device that streams high-def movies, photos and music on tablets, smartphones and computers. It also includes an SDHC/SDXC card slot for instant sharing of those awesome birthday pictures and videos. **SanDisk.com**



### TRACKSTICK II

Trackstick II is a fun and immersive way to show where you've been and record your explorations. Trackstick is a pedometer on steroids as it traces your traveled locations on satellite photos and 3D terrain. Trackstick continuously records its exact route, stop times, speed, direction and other valuable information, all of which can be quickly downloaded and viewed on your computer.

**Trackstick.com**





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# THE UNIQUE RISKS OF THE BUSINESS PILOT

YOUR AIRPLANE IS ONE OF YOUR MOST IMPORTANT TOOLS FOR SUCCESS. ■ By Thomas P. Turner



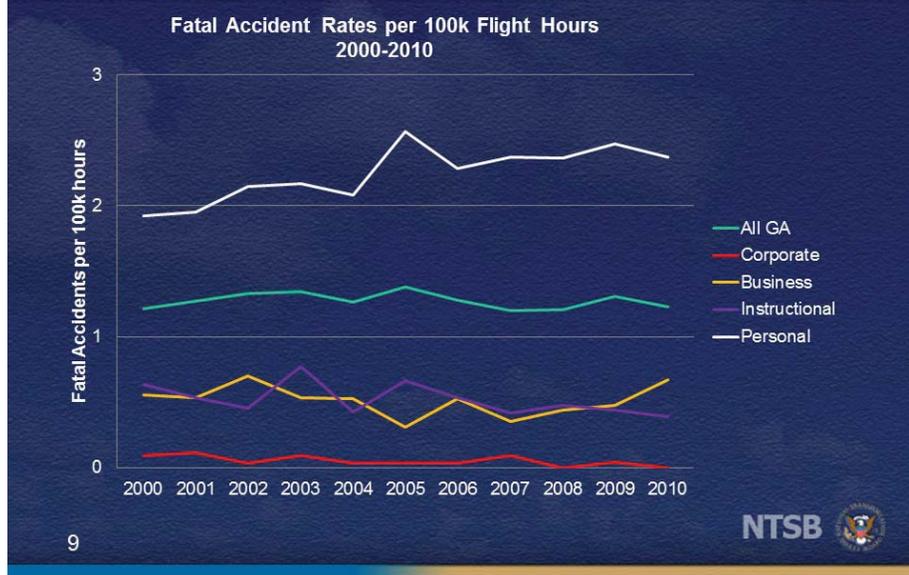
**Y**ou derive great pleasure and satisfaction from flying your airplane. You enjoy being aloft, the interaction with other pilots and controllers, and the feeling of mastery over a complex technical skill. Flying may be an artistic or creative outlet and enhance your perspective on other aspects of your life.

But if you fly for a business you own or manage, ultimately the airplane is a business tool. Flying gives your business a greater operational reach. It permits you to oversee remote operations more closely and better serve your customers. A company airplane lets you outflank the competition. Your airplane is a vital extension of your business.

The National Transportation Safety Board tells us business flying is statistically much safer than General Aviation as a whole. Unfortunately, deadly mishaps still happen in business aviation. And more disturbing, there is a clear trend upward in the rate of fatal business-flying accidents.

The things that make us safer in all types of General Aviation — crosswind control, fuel management, weather avoidance, aircraft maintenance, emergency preparedness — work equally well in the business cockpit. There are some unique aspects of flying an airplane in the furtherance of a business you own or manage, however, that can add an additional layer of risk. The good news is that, if you apply the same forward thinking to piloting the company airplane that you do to piloting the company itself, you can manage the unique risks of the business pilot.

## Fatal Accident Rates per 100k Flight Hours



### SCHEDULE

What good is a business airplane if you can't fly where you want, when you want? Some conditions or situations, despite your best efforts, are going to require you delay or cancel a flight. A line of strong thunderstorms, heavy icing conditions, or areas of low fog can make the no-go decision easy. Severe personal health issues or major mechanical issues with the airplane are also obvious no-go calls. The unique risks of the business pilot occur when the conditions are not so clear-cut, situations that require a judgment call and that may be in direct opposition to your business transportation needs.

### TRUE STORY

While I was a young flight instructor in a one-man flight school in central Missouri, a shiny new Beechcraft Bonanza A36 landed at our rural airport. Two passengers drove off with their local business contact, while the pilot stayed behind. I learned the Bonanza was owned by a chain of funeral homes based in Topeka, Kan., and the passengers were owners on an inspection tour of their remote offices.

As the afternoon wore on, the pilot was watching a line of thunderstorms form along the Kansas/Missouri border on the FBO's computer. When the company owners returned, he explained that the storms were cutting off their path home, and they would have to wait a couple of hours until the line blew past. The passengers became

very agitated, one stating repeatedly that he had to get back to Topeka for a very important meeting. They were heavily pressuring the pilot to get them through the line of storms that was by then solid, severe and extending hundreds of miles in each direction. One owner threatened to fire the pilot and looked at me in a way that suggested, "You'll get me through it, won't you kid?"

The Bonanza pilot then said something very wise: "Do you want to be owners of a funeral home, or customers?"

This struck home, because the passengers backed down immediately. An hour and a half later, they were airborne in smooth, clear skies behind the line of storms after it passed.

That pilot's dedication and his quick summation of the situation to his passengers left a great impression on me. Looking back, I wonder what would have happened if one of the business owners was the pilot. Would he have let the stress of an impending meeting cloud his judgment and try to pick his way through the storms? So very often that's exactly what we read about when a business airplane is involved in a crash.

### RISK FACTORS

Let's look at some of the risk factors and suggest some ways you can avoid making a bad business aviation call:

**Weather:** Assuming you and the airplane are instrument-rated and current, there's not much you can do about the weather. NEXRAD uplinks and ADS-B weather are

a help, but they do not alter the airplane's ability to handle adverse weather; they just make it easier to avoid getting too close to it. Weather hazards are the No. 1 reason for delays and cancellations of airline flights, and your business-use airplane isn't any different. In other words, there's no such thing as an all-weather airplane. The more you fly, the more often you'll cancel or reschedule flights.

So how do you protect against adverse weather impacting your business schedule? Like any other business contingency, you plan for it. Be ready to leave a few hours earlier, or to stay a few hours later, if the weather requires. Keep a RON (Remain Over Night) bag in the airplane with fresh clothes and toiletries in case you have to cancel a flight away from home. Watch the weather frequently enough that you can make alternate transportation plans if a major weather outbreak is forecast. Let the people you'll meet know you may have to change your meeting plans if the weather's too bad. It may limit your ability to make the sale today, but subtly let them know it's a part of your strategy to ensure you'll be around to serve their needs after the contract is signed. These mitigations all help you maintain a constant mindset that weather delays are going to happen, and you'll have Plan B at the ready if needed.

**Maintenance:** The best defense against aircraft maintenance delays or cancellations is to give the airplane the maintenance budget it needs. If your computer system broke down, you'd fix it. The airplane may be just as important to your business, so you have to keep it maintained as well.

The next most important defense is to catch issues before they impact your flight schedule. Take a few moments after the last flight of the day to give the airplane a post-flight inspection, the same as a preflight, done when there's time to have a discrepancy fixed before your next planned trip. Do a thorough preflight inspection a couple of days before a flight for the same reason. If you don't have time to get to the hangar that often, teach a local instructor how to conduct a good exterior preflight inspection of your airplane, and then pay him or her for an hour at their instructional rate to check out the airplane and report discrepancies once a week or on demand. None of this replaces your need to personally preflight the airplane before a trip, but these added inspections will curtail those last-minute maintenance squawks and help you avoid the temptation to fly with a known maintenance fault.



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**Training:** Deep down you know you should train more often or seek out more challenging training than you currently do. Trouble is, training takes time — the businessperson's most valuable resource — and it's easy to defer training again and again under the stress of running a business. Before you know it, two years will have passed, and you need a quickie Flight Review just to meet minimum requirements. You probably don't accept minimum standards from your employees (or yourself) in the business, and a business mistake probably won't kill you. Think of quality recurrent training a couple of times each year as a mini-vacation, a time away to indulge your interest in flying. Put it on your calendar far enough in advance so you can schedule work around it.

**Fatigue:** You put in long hours at the office. You wear yourself out when you're on the road. Are you in any shape to pilot a complex machine into potentially dark and stormy skies? Will you be alert enough to fly a complex approach after a couple of hours bouncing along in the

*The risks affecting business pilots are the same that impact pilots of all General Aviation airplanes. The hazards become more acute, however, under the real and imagined time pressures of running a company.*

airplane? Growing evidence suggests sleep deprivation and fatigue have an adverse impact on almost every aspect of our lives (including business decisions). The NTSB is beginning to investigate the sleep cycles of pilots for the 72 hours prior to a crash.

There is no FAA standard regarding crew rest for Part 91 pilots. No one has done real science into the impact of fatigue on business pilots. It's up to you to decide if you're too tired to take off and predict whether you'll be alert enough

to approach and land on the other end. Taking a cue from the airline industry, which science has addressed, the National Business Aircraft Association has recently published recommended crew rest and duty day standards for business pilots. In its simplest form, NBAA suggests no more than 10 flying hours in any 24-hour period, and more apropos to most business pilots, a maximum 14-hour duty day from wake-up in the morning to engine shutdown at the end of a flight. (See the full recommendation at [NBAA.org](http://NBAA.org).) A 14-hour limit may be challenging in a business environment, but it's a limitation you can live with.

The risks affecting business pilots are the same that impact pilots of all General Aviation airplanes. The hazards become more acute, however, under the real and imagined time pressures of running a company. With planning, discipline and flexibility — the same attributes that make you successful in business, you can manage the unique risks of the business pilot. 



*Convective outflow boundaries emanating from deep, moist convection or thunderstorms may be a precursor for an encounter with severe or extreme turbulence and dangerous low-level wind shear. But they may also quietly pass by without raising a single leaf on a tree.*

# A HIDDEN DANGER... CONVECTIVE OUTFLOW BOUNDARIES

SPRING THUNDERSTORMS BRING NEW CHALLENGES ■ By Scott C. Dennstaedt

Whether you're scanning the sky with your onboard radar or have the weather in your immediate view, many pilots flying turboprop aircraft have little difficulty maneuvering around a convective threat while en route. It's the terminal environment that can become really dicey and get the heart pumping, especially when the thunderstorms are embedded. Onboard radar can do a great job keeping you away from the worst part of the storm, but thunderstorms create significant hazards down low that are essentially invisible up to the moment you encounter them, especially when you are in IMC. One of these hidden threats is called a convective outflow boundary.

Convective outflow boundaries emanating from deep, moist convection or thunderstorms may be a precursor for an encounter with severe or extreme turbulence and dangerous low-level wind shear. But they may also quietly pass by without raising a single leaf on a tree. The pilot's best defense is to recognize and characterize the outflow boundary using visible satellite and ground-based radar imagery before departing in advance of deep, moist convection.

So what is a convective outflow boundary?



## A GUST FRONT

According to research meteorologist and thunderstorm expert, Dr. Charles Doswell, “cold, stable air is the ‘exhaust’ of deep, moist convection, descending in downdrafts and then spreading outward like pancake batter poured on a griddle.” As a thunderstorm reaches a point where its updraft can no longer support the load of precipitation it has accumulated inside, the precipitation load collapses down through the original updraft area. Evaporation of some of the precipitation cools the downdraft, often making it even denser when compared to the surrounding air. When the downdraft reaches the ground, it is deflected laterally and spreads out almost uniformly in all directions, further retarding the inflow of unstable air into what was left of the storm. This outward flow away from the storm is called an outflow boundary.

*An outflow boundary is essentially a mesoscale cold front; it is a boundary between the cooler, denser outflow air from the storm and the surrounding, warmer environmental air.*

Outflow boundaries are often seen moving away from weakening thunderstorm cores. They tend to have a very circular or crescent-shaped symmetry just like that pancake batter on the griddle. Such symmetry to the outflow is common in environments of very weak flow near the surface in the surrounding air mass. Otherwise, the shapes of the boundaries

would be more distorted. An outflow boundary is essentially a mesoscale cold front; it is a boundary between the cooler, denser outflow air from the storm and the surrounding, warmer environmental air.

## THE MICROBURST

An outflow boundary is not the same creature as a microburst. While they are similar in many respects, microbursts occur on a much smaller scale and may persist for only five minutes or less. As defined by Dr. Theodore Fujita, a microburst is a small concentrated downburst with a spatial scale on the order of a runway length (four kilometers) and can be more violent than any outflow boundary.

In many cases, these microbursts are associated with moderate to heavy precipitation that may be visible below the cloud base as a concentrated rain shaft. From a distance, you may see what



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appears to be an opaque globular mass of rain at the bottom of the shaft that represents precipitation “piling up” in the downburst of rain-soaked air from the storm. Many microbursts occur in what seem like rather benign conditions, such as a high-base convection inviting the pilot to fly under one of these.

### THE SURFACE ANALYSIS CHART

Whenever a significant outflow boundary exists, it will be analyzed on the mean sea level (MSL) surface-analysis chart. Every three hours beginning at 0000 UTC the Weather Prediction Center (WPC) in College Park, Md., issues a new surface-analysis chart. This chart depicts surface weather features such as an isobaric analysis (including high and low pressure centers), surface observations, fronts, squall lines, drylines, troughs and outflow boundaries. Outflow boundaries are depicted by a dashed tan line, two of which are shown on the following page (*Figure 1*),

*In many cases, these microbursts are associated with moderate to heavy precipitation that may be visible below the cloud base as a concentrated rain shaft.*

and are labeled OUTFLOW BNDRY on the chart. Pressure troughs are also depicted similarly, but do not carry any specific label.

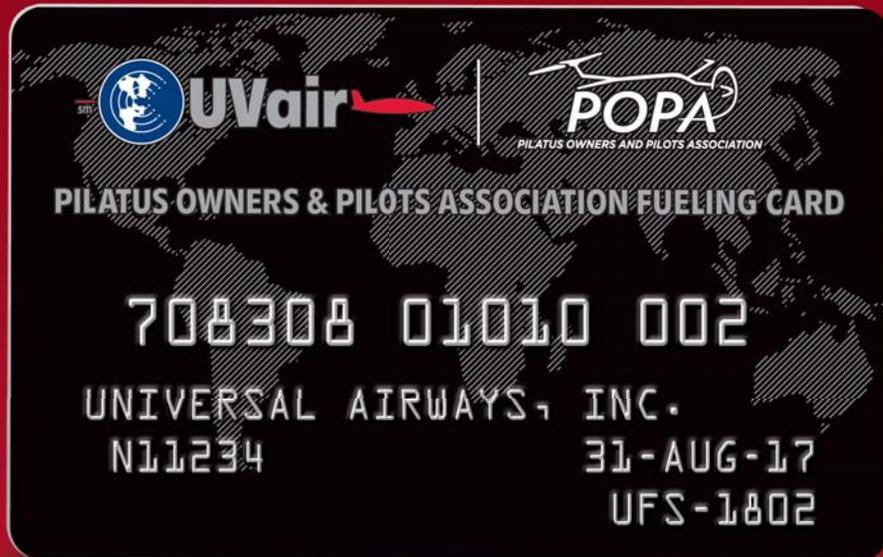
While this chart is very useful to identify the location of outflow boundaries, it isn't much help in real time since the surface-analysis chart is only issued every three hours and is not available for nearly 90 minutes after the valid time. To identify outflow boundaries in near real time, you have to examine visible satellite and ground-based radar imagery.

### DETECTION ON THE VISIBLE SATELLITE

On the visible satellite image, an outflow boundary in southwest Missouri is the crescent-shaped area of clouds on the southern edge of the deep, moist convection (*Figure 2*). An important observation is to note the motion of the outflow boundary relative to the motion of the convection, using a satellite loop. If the outflow boundary is moving in advance of the convection, it likely represents a gust front and should strictly be avoided. However, the motion of the outflow boundary isn't always in the same direction as the general motion of the thunderstorms.

Outflow boundaries such as this one are still considered gust fronts even if they don't move in advance of the convection. However, they generally do not produce as strong straight line winds and equivalent severe turbulence and low-level wind shear as a gust front that tracks ahead of the convection. The risk of significant turbulence and low-level wind shear decreases as the lead-

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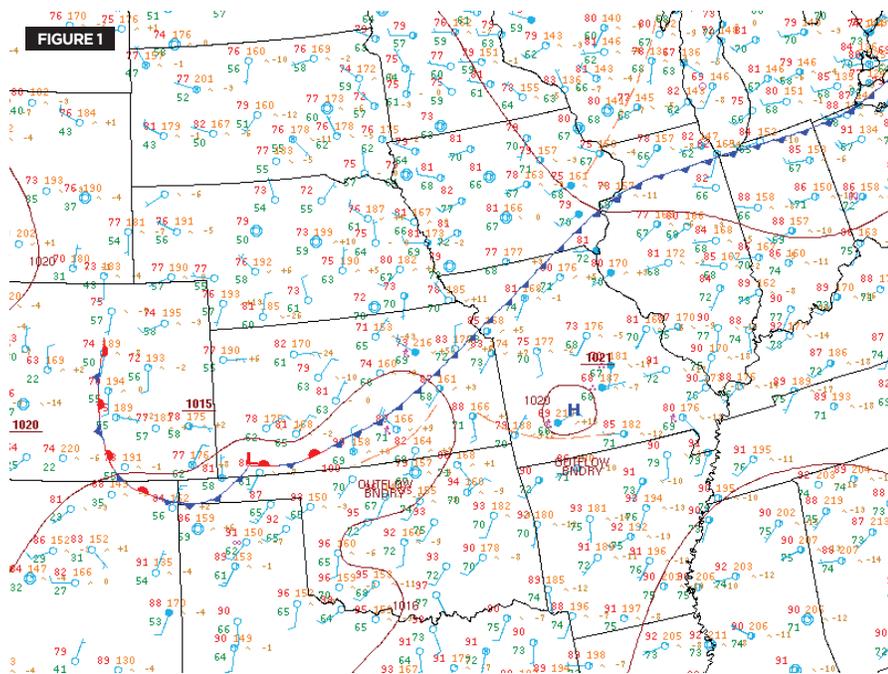
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**Figure 1 - Surface-Analysis-Outflow-Boundary.gif** - On the mean sea level surface analysis chart, outflow boundaries are depicted as a light brown dashed line labeled **OUTFLOW BNDRY**.

ing edge moves away from the convection that generated the outflow boundary. After spreading outward, the leading edge of the boundary often climbs and may produce dense cumuliform clouds on the boundary and may initiate other convection. This is seen quite often in southern Florida. As is the case of most cumuliform clouds, they can contain moderate or greater turbulence within the cloud boundary.

## A ROUGH RIDE

The inherent danger in flying through or near an outflow boundary is the wall of atmospheric mixing (turbulence) that occurs over a short distance. Let's assume you are departing an airport and hit the outflow boundary head on while climbing out at 3,000 feet above the ground. You will first encounter a curtain of upward moving air. The average maximum upward vertical velocity of air in the gust front is on the order of 10 meters per second or about 2,000 feet per minute. Just when you think it may be over, in less than a minute this upward moving air is usually followed by a similar downward vertical velocity of air at the same magnitude. For an aircraft in flight, these two events can happen nearly back-to-back, creating an extreme hazard.

There is a silver lining, however. The ascent and descent for an average outflow boundary is usually contained within 6,000

feet above the surface. So this is indeed a low-level event that is ordinarily encountered on approach or departure, not in the flight levels while en route.

## DETECTION ON NEXRAD

At night or when no clouds are associated with the outflow, a gust front may be detected on the NWS WSR-88D NEXRAD Doppler radar. Given that outflow boundaries are low-level events as discussed above, they do not necessarily produce precipitation. Instead, the radar will detect the density discontinuity of the bound-

ary itself along with any dust, insects and other debris that might be carried along with the boundary. In this particular case, the outflow boundary (**Figure 3**) shows up very well on the NWS radar image out of Springfield, Mo., as a bow-shaped line of low reflectivity returns. Keep in mind, as the outflow boundary moves away from the radar site, the boundary may appear to dissipate. When, in fact, it may be that the lowest elevation scan of the radar may be overshooting the boundary.

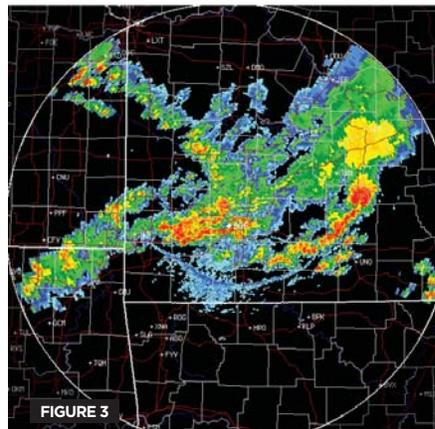
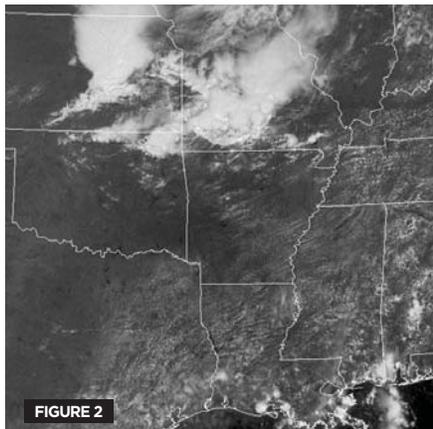
The radar signature for outflow boundaries is ordinarily quite weak. Therefore, they are often filtered by satellite-delivered weather. The XM-delivered radar broadcast, for example, does not include any returns that are less than 10 dBZ. While this broadcast will keep you away from the worst part of the storm, don't expect it to capture any outflow boundaries marching away from a line of convection.

What is particularly interesting is that outflow boundaries are often tracked by forecasters. Over time, outflow boundaries can move hundreds of miles away from the convection that created them. In fact, they often persist much longer than the convection itself. Each day's thunderstorms lay down outflow boundaries that will almost certainly play a role in the next day's convective activity. Therefore, by tracking these outflow boundaries, an astute forecaster can often get a heads-up on where those thunderstorms may erupt the next afternoon. *POPA*

Scott C. Dennstaedt is a CFI and former NWS research meteorologist. He holds live aviation weather workshops throughout the U.S. To learn more about aviation weather, visit his website at [AvWxWorkshops.com](http://AvWxWorkshops.com).

**Figure 2 - Visible-Satellite-Outflow-Boundary.gif** - An outflow boundary is seen on this visible satellite image as a crescent-shaped line of clouds in extreme southwestern Missouri. The convection just to the north was moving from west to east. Given its close proximity to the thunderstorms, it would be advisable to wait for this outflow boundary to pass before departing Branson West Municipal Airport (KFWB) located at the southernmost edge of this outflow boundary.

**Figure 3 - NEXRAD-Outflow-Boundary.gif** - The outflow boundary shown on the visible satellite image in Figure 2 is also visible on the Springfield, Mo., NEXRAD Doppler radar image. The outflow boundary is the crescent-shaped line of low reflectivity returns oriented west to east in extreme southwestern Missouri.



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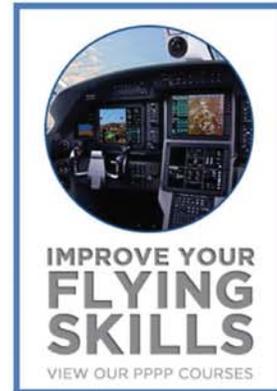
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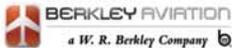
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## WHERE WILL THE 2014 TAX LAWS TAKE AVIATION?

**DESPITE SOME AMBIGUITIES, NOW IS THE TIME TO START PLANNING.** ■ By Harry Daniels, CPA, CFP, PFS, CVA

Where we and our tax positions are heading in 2014 is still anybody's guess at this point. Congress has promised hearings on the tax extenders in April. Congress has submitted a tax package, and the White House has prepared its budget. Surprisingly there are a lot of similarities but some major differences as well.

The Senate Finance Committee wants to make the extenders permanent tax law instead of revisiting these same issues every year or two. Let's take a look at a couple of the tax extenders that are significant to aviation.

Sales tax is a big issue for aviation both at the federal and state tax levels. I can't

think of a state that does not have a personal or corporate income tax and sales tax tied to this. All 50 states have sales tax issues. For federal tax purposes, the sales tax deduction for individuals as an itemized deduction (Schedule A) expired at the end of 2013 and is presently off the books – unless extended by Congress. Without being extended, the loss of this deduction could have a negative impact on aviators who fly for the love of flying and have no tax-deductible business reason for spending their money to fly.

The 50 percent bonus depreciation on new equipment expired at the end of 2013 unless you had made a qualifying deposit to purchase a new aircraft to be delivered in 2014. Since the addition of the bonus depreciation sometime around 2002, we have seen various percentages ranging from 30 percent all the way up to 100 percent with the last couple of years being 50 percent. This provision has been a strong economic incentive for business to expand and replace their aging equipment. Hopefully this will be reinstated and made a permanent part of the tax code.

Section 179 is still alive and almost well but it has

*Congress is looking at changing the depreciable life of a non-commercial plane from five years to seven years. That seems to have everybody in an uproar. But when you think about it, it is really not the end of the world.*

taken a severe blow. For years 2010 through 2013, the maximum Section 179 deduction was \$500,000 assuming you had income to absorb that much of a deduction. Now for 2014, the maximum deduction for Section 179 has been reduced to \$25,000. Personally, I will go out on a limb and say that I expect this amount will be raised but I am not willing to make a prediction on the amount. I will tell you that this is one of the extenders under consideration to be made permanent. Also, some of the dollar limits I have seen discussed are higher than any prior amount we have seen. This could be a strong incentive to aviation and allow a

rapid tax write-off for equipment assuming you have the income to take the deduction.

For 2014, the tangible property depreciation and repair regulations will be a factor to deal with. We are expecting brand new elections will need to be made each year on business returns and schedules regarding the deduction for repair expenses and supplies. Also, you will need to be spot-on in selecting the proper depreciation life and method. You may find yourself becoming very well acquainted with Form 3115 (Change In Accounting Method) in dealing with these new regulation requirements. Make sure you have your written business capitalization policy in place. Aviation got a big boost from these regulations on deducting annual inspections and TBOs.

Congress has kicked the depreciation life of an airplane around for several years. An aircraft not used commercially generally has a tax life of five years. It doesn't matter if the plane is 23 years old when you buy it; you assign it a five-year depreciable life for tax purposes. So at the end of five years (technically six years), you have fully depreciated the plane. Congress is looking at changing the depreciable life of a non-commercial

plane from five years to seven years. That seems to have everybody in an uproar. But when you think about it, it is really not the end of the world. When you compare the two, almost 87 percent of the plane would be depreciated after five years using the seven-year rule when compared to fully depreciating the plane after the current five-year rule. So there is only just over 13 percent that is hanging out there for the last two years.

Pay close attention to the Section 274 documentation rules for the business use of your plane. This is mandatory – who, what, where, when and, most importantly, why. Without this required information about the use of your plane, the IRS can totally disallow all your aviation travel expense including the depreciation. Don't go to sleep on this.

Be sure to stay in touch with your tax preparer. These changes could have a major impact on your 2014 tax return. 



O. H. "Harry" Daniels Jr. is a CPA, a CFP licensee, and a certified valuation analyst. He is a partner with the firm of Duggan, Joiner & Co., Certified Public Accountants, and can be reached at 334 N.W. 3rd Ave., Ocala, Fla., 34479, telephone 352.732.0171, fax 352.816.1370, email OHD@DJCoCPA.COM. He has held his license as a private pilot since 1991. This article is available for reprint upon request.

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# DO YOU THINK I'M PUTTING ON THE POUNDS?

ONLY A WEIGHT-AND-BALANCE CALCULATION CAN TELL! ■ By Tim Cloutier

One of the great advantages of flying the Pilatus PC-12 is that it has an incredibly high useful load when you want to carry a lot of people, bags or even cargo. The unique cargo door and large cabin interior attest to the fact that Pilatus wanted to design an airplane that could haul a lot without compromising range or comfort. While in most aircraft, fuel and weight are a trade-off, the PC-12 allows you to still carry the whole family and your bags with enough fuel to make it to your destination without having to make an extra stop.

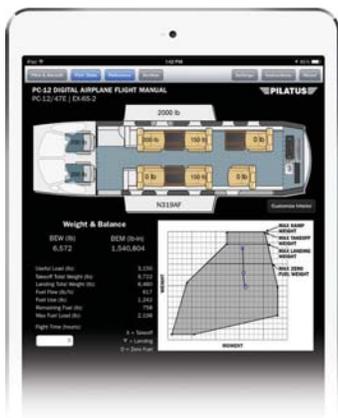
Along with the PC-12's great ability to carry so much comes the responsibility to make sure that the weight-and-balance is correct, and limitations are not exceeded. It can be easy to fall into the trap that the PC-12 is so capable that it can carry everyone and everything all the time without a problem. Like everything in aviation, there are limits and rules to be followed. Failing to do so can get you in trouble with the FAA — or even worse. Hard as they might seem to exceed, the weight and center-of-gravity (CG) location are limitations of the aircraft, and going outside the approved envelope could make the aircraft uncontrollable. Even if the aircraft seems to fly just fine over gross weight, you still risk damaging it if you hit unexpected heavy turbulence or make a hard landing.

For most private operators, there is no direct regulation that says that a weight-and-balance must be completed. However, the FARs list what needs to be accomplished for pre-flight action under 91.103. There we find the ambiguous “become familiar with all available information concerning the flight.” One could accurately speculate that completing a proper weight-and-balance would be one of the steps in becoming familiar with all aspects of the flight. Parts 91K, 121, and 135 have

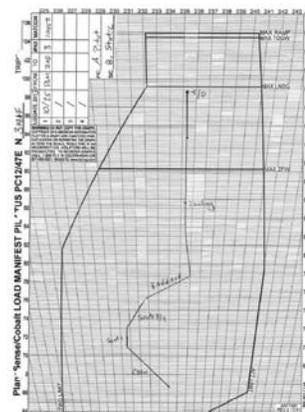
additional weight-and-balance requirements, but for private 91 operators, the weight-and-balance knowledge could be as simple as that — the weight of the aircraft and the balance being where the center of gravity lies. Once you are familiar with your aircraft and how your missions affect the weight-and-balance, it's a lot easier to know when you might be getting close to reaching a limit.

Now that we know why it's important to do a weight-and-balance, how do we complete one that will tell us what we need to know without taking an eternity to complete? We all remember our flight-training days spending what seemed like hours with weight-and-balance tables, multiplying arms and weights to find moments, then a lot of adding and some division until we finally had the weight and CG of the aircraft. Luckily for us, technology is here to help. Yes, you can still use tables — Pilatus even provides them for you in the POH, but there are easier and quicker methods available.

One of the simpler methods is to take the table from the POH and convert it into a spreadsheet. Simply type in the weights and let the computer do the math for you. There are also a variety of programs and apps available online that will do the same for you, and many also provide a graphic of the loading envelope.



Pilatus Digital Airplane Flight Manual App



Plotter and graph method



# Weight and Balance

Be forewarned, though, many of these programs are not free, and the apps are only as good as the numbers that are entered in. For instance, if the arm location for the passenger seats is not entered properly, your entire calculation will be wrong. Many also do not have all the various interior configurations that the PC-12 now comes with. It won't do any good running a weight-and-balance for an eight-seat configuration if you own a six-seat executive interior! It's not really worth the \$10 you just spent in the app store if it doesn't work.

Another method is to use a plotter and graph. Unlike the computer method, these components are definitely not free. A good plotter can cost more than \$100 and a box of graphs around \$50. The advantage is no math is required. Just plot the weights using the labeled sides of the plotter and, voila, you've completed a weight-and-balance in about 30 seconds. Plus if you want to keep a copy of your data, you now have an instant record, no extra printing or emailing needed.

Pilatus has also developed its **Digital Airplane Flight Manual** app. This may be

the most accurate digital method since all the data on aircraft configurations comes directly from Pilatus. Again, it's as simple as putting in the basic weight of your aircraft and adding the passengers, bags and fuel to find the final weight and CG. The app even displays the loading graph for you.

No matter what method you use to calculate the weight-and-balance, it's important to make sure you put in the right numbers when you start the calculations. First, make sure you use the most current weight-and-balance revision in your POH. This was, we hope, done by your mechanic the last time you had any equipment added or removed from the aircraft. Even if you haven't made any changes, remember that your aircraft was probably first weighed without any interior installed and then re-weighed once the work was completed. Hard to believe, but all those seats, cabinets, walls and carpets can weigh more than 800 pounds!

Next, to get accurate weights of baggage, you'll need a **scale**. That may seem like a silly thing to carry around with you but remember that the baggage compartment has a limit of 400 pounds. Having the accurate

weight of all those bags could prevent you from exceeding this limitation, and it will also give you a much more accurate figure for your calculations. For quick and easy weighing, consider a dial-type floor scale or hand-held pulley scale. At PlaneSense, we use a Rubbermaid commercial scale with a weight capacity of 250 pounds. Even an inexpensive digital bathroom scale will work as long as it can handle the weight of the bags you're loading.

Many programs and apps also call for using the basic empty weight (BEW) which is the standard empty weight of the aircraft plus optional equipment. Those are a good starting point, but remember that when your aircraft was weighed, the BEW may not have included things like charts, catering or a life raft. Those things can easily add up to more than 100 pounds, and having to add them back into the weight-and-balance each flight can get annoying. Instead, if those items will be onboard each time you fly, you or your mechanic can adjust the BEW to a Corrected Empty Weight (CEW) by weighing and calculating a new weight-and-balance with those items onboard. Simply use that {Continued on page 54}



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Garmin Pilot 6.1 on iPad Air

# UPGRADES AND TRAVELS

THE BEST IPAD APPS (AND ACCESSORIES), SUMMER 2014

By John D. Ruley

**L**Pilots tend to be conservative – and I’m no exception. I didn’t try an iPad until they’d been available for quite awhile, and I wasn’t the first pilot in my area to use one. That also made me slow to upgrade the operating system that controls all iPad functions. Since iOS 6.x was working, I wasn’t in a hurry to try out iOS 7.0. Based on what I’d heard from other pilots and read on the web, that may have been a good thing. The 7.0 version of iOS had a reputation for flattening batteries quickly and for being less than stable in some situations.

Fortunately, Apple hasn’t been standing still, and successive patches and upgrades have pretty much cured the early problems. So I finally got around to upgrading just recently, and I’m pleased to report that, so far, what’s now iOS 7.1 has been completely stable and a bit faster than the old version on my trusty iPad 2. Be aware of a couple things if, like me, you haven’t upgraded until now.

First, I highly recommend backing up before any upgrade. You can do this by syncing with a desktop or laptop computer (either a Mac or Windows

PC) or using Apple’s iCloud service. I did the former. With that complete, open the iPad’s Settings app, select the General tab, and tap Software Update. You will need an internet connection (wi-fi or cellular).

During the update, you’ll hit the first possible gotcha – you’ll be asked if you want to enable automatic updates for apps. I strongly advise not enabling this feature. If you do, any time your iPad has a live internet connection and detects an upgrade for one of your apps is available, it will download it. That’s convenient for people who mostly use the iPad in an office environment but, for pilots, it could mean that upgrades will be downloaded at inconvenient times and places – like while driving a crew car or at the desk at an FBO – leaving you with less than the full battery charge you want before departing on a long leg. If you decide later on that you want to try this feature out, you can find it in the iTunes and App Store settings.

The update takes several minutes to finish. When it’s complete, you’ll be introduced to the new home screen and the “flat” look that received so much attention when iOS 7 was first introduced. I am happy to report that all apps, including a wide variety of aviation appli-

Apple iOS7 App Select screen



cations, survived the upgrade with their settings intact.

I’d held off upgrading iTunes on my PC and had to upgrade it (to version 11.1) before I could sync after upgrading my iPad. That took a few more minutes.

Aside from the new look and the auto-update feature, a few changes in the way things work may come as a surprise. Switching between apps – and closing those not in use – is still done by pressing the home button twice. In the new version, you won’t see the Ribbon Bar of icons for all running apps. Instead, you’ll see small versions of the app windows. Scroll left or right to find the one you want. Tap to bring it to full screen or swipe up with two fingers to close it.

Other operational changes – mostly small – take some getting used to. I highly recommend spending at least a couple of hours playing with an iPad after upgrading before taking it on a busy trip. The iOS 7.1 upgrade is free. For more information browse [Apple.com/ios/](http://Apple.com/ios/).

## GARMIN PILOT 6.1 OFFERS SYNTHETIC VISION

In our Winter 2013 issue, I discussed apps (and other techniques) for emergency use and highlighted Xavion, which provides GPS-based synthetic vision with automatic guidance

to the nearest runway. Garmin is now offering a synthetic vision feature in the latest version of their Garmin Pilot app. It provides a display basically comparable to what you'd see on the primary flight display (PFD) of an aircraft with a G1000 glass panel. In addition to synthetic vision and typical glass panel PFD features, Garmin Pilot can provide weather and traffic displays when used with Garmin's GDL-39 3D portable ADS-B

data link receiver. Garmin sells the Pilot app on a subscription basis for \$74.99 per year. A one-month free trial is available. The GDL-39 3D has a suggested retail price of \$849. You can find the Garmin Pilot app at the iPad AppStore. For more on the GDL-39, browse **Buy.Garmin.com**

**AIRSTASH: PORTABLE IPAD BACKUP**

Backup can be an issue for iPad users – something I'm especially sensitive to as a pilot, writer and photographer. In the cockpit, we mostly worry about an iPad not working at all, so I use (and recommend) paper back-up charts. Other pilots I know carry more than one iPad so one will always be available. But another kind of backup can be an issue if you travel and use an iPad as your

only computer. This became apparent to me as I prepared to spend a week in the Mexican state of Campeche, assisting in a medical mission with Liga International (The Flying Doctors of Mercy). WiFi access isn't available there outside of major hotels and, while cellular access was available in some locations, it was a less than ideal option. Apple sells an iPad camera connection kit that includes a reader for Secure Digital (SD) data cards, but it will only read from the cards, not write to them. What I wanted was something that would let me both read from and write to an external data device.

The AirStash A02 solved my problem. It's a black and green gizmo slightly larger than a cigarette lighter, with a USB connector (used to charge its internal battery) at one end and an SD card slot on the other. Insert an SD

card in the slot, turn AirStash on and the iPad will see it as a wi-fi access point. The companion AirStash app lets you copy photos and documents from the iPad to the SD card and back. It worked perfectly for me, backing up more than 1 gigabyte of photos and documents during the week – all on one charge. (In fact, as I write, the AirStash is still partly charged almost a month later!)

The AirStash A02 sells for around \$70. (I got mine from Amazon.com.) For more information, browse **AirStash.com**.

I hope your travels are safe and fun! *POPA*

**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 Liga International, 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 at jruley@ainet.com.**



AirStash A02

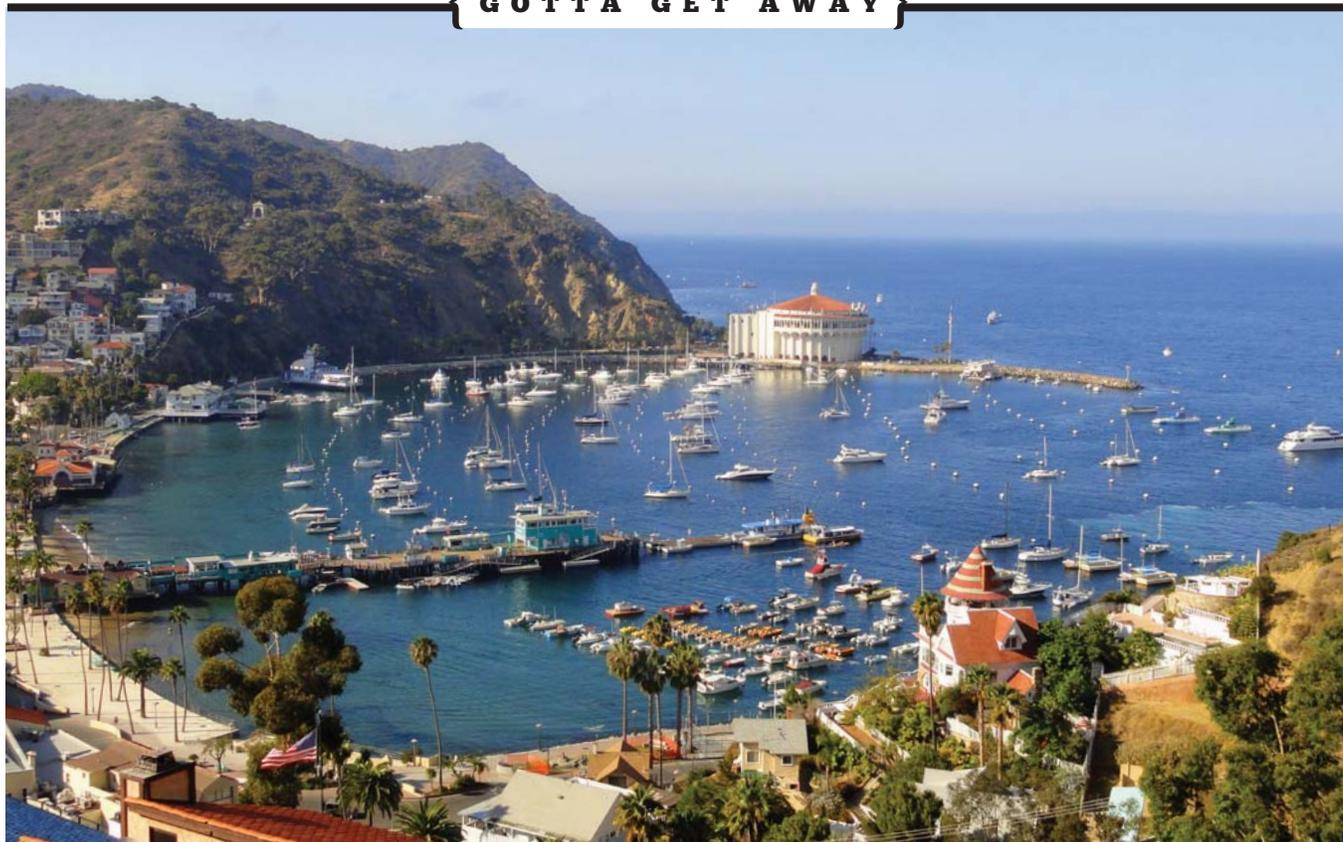
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# WEEKENDERS

GOTTA GET AWAY



## SANTA CATALINA REMAINS THE ISLAND OF ROMANCE

BY MICHELLE CARTER

If a 26-mile hop over the Pacific holds any appeal for you, Santa Catalina, the Island of Romance in the Four Preps poster song of the '50s, awaits.

Catalina, the southernmost of the Channel Islands that stretch along the California coast from Los Angeles to Santa Barbara, has been inhabited (on and off) for the past 7,000 years. Pleasure-seekers from the mainland have followed a parade of explorers, smugglers, gold diggers, pirates, hunters, Union soldiers, missionaries and entrepreneurs who knew a gem when they found it.

In the mid-19th Century, California's richest man, James Lick, bought the island and became the first to try to establish a resort there. Chewing-gum magnate William Wrigley finally succeeded at the task in 1919. He built a casino and brought his Chicago Cubs to the island for spring training until the mid-'50s.

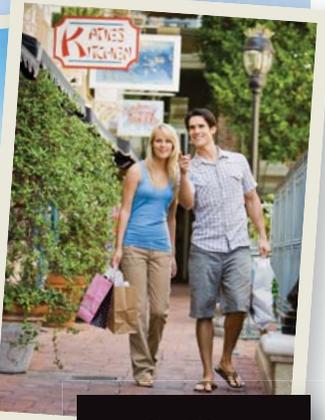
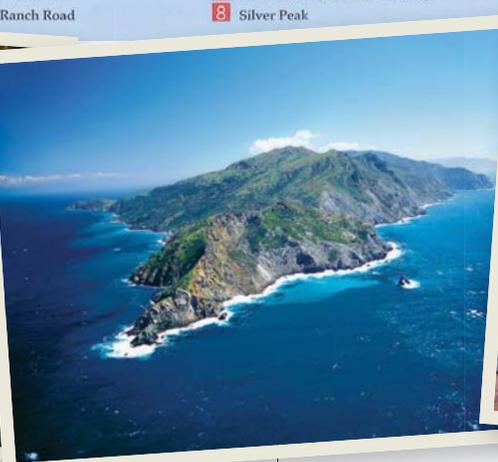
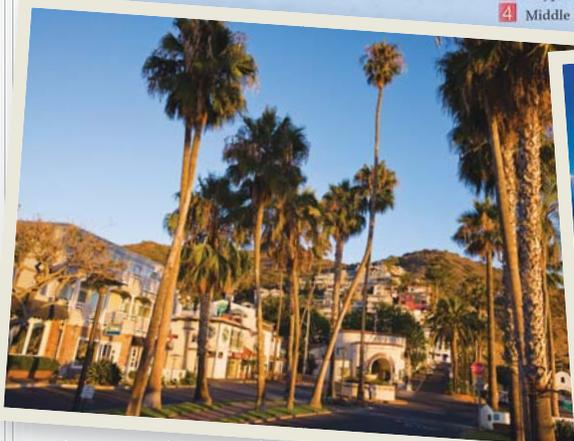
During the '30s, '40s and '50s, Catalina was the playground of the Hollywood set and prominently featured in many films made during the period. Wrigley heirs

gave 88 percent of the island to the Catalina Island Conservancy in 1975; the rest is still owned and operated by the Santa Catalina Island Company.

Perched on a man-made 1,600-foot mesa in the center of the 22-mile long island is Catalina's Airport in the Sky (KAVX), which is run by the Conservancy. It features a 3,000-foot runway (in fair condition, according to AirNav) and offers tie-downs but no fuel — so

top off before you leave the island. An island shuttle will carry you to Avalon, the easternmost and most densely populated town, or the unincorporated Two Harbors at the "waist" of the hour-glass shaped island.

Campgrounds and hiking trails criss-cross Catalina, but most of the visitors are heading for the beaches and coves of the east end or Two Harbors. Water and land expeditions are available year-round to



take you to the rugged west end and on around the island, but you won't want to miss the iconic casino right on the harbor in Avalon. Wrigley's circular Art Deco wonder now houses a movie house, museum and ballroom, which once showcased all the Big Band greats.

For the full resort treatment, you may want to settle in at the Hotel Atwater or the

Pavillion Hotel near the beach in Avalon. But for a genteel step back in time, consider a stay at Banning House Lodge near Two Harbors. This 12-room bed-and-breakfast has given new life to the Craftsman-style lodge that the Banning brothers built as their summer home in 1910 when they owned the island. You can settle into the trellised

courtyard for a glass of wine and spectacular views of the coastline at Two Harbors and the California mainland.

An overflight of the island before you land will orient you to Catalina, but you'll need to stay at least 500 feet above the terrain on the west end January through July to protect the nesting Bald Eagles which have just

been reintroduced to the island. Prominently mentioned in diaries through the mid-20th Century, DDT contamination from mainland industry wiped them out in the '70s. Conservation efforts have restored Bald Eagles to the island, and 25 nesting birds are now raising families on Santa Catalina.

Guess it's still the Island of Romance.

**IF YOU GO...**

**AIRPORT IN THE SKY (KAVX)**  
P.O. Box 2739  
Avalon, CA 90704  
310.510.0143  
CatalinaConservancy.org

**BANNING HOUSE LODGE**  
1 Banning House Road  
Two Harbors, CA 90704  
800.628.1496  
VisitCatalinaIsland.com

**PAVILLION HOTEL**  
513 Crescent Ave.  
Avalon, CA 90704  
877.778.8322  
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## CHATTANOOGA WILL ANCHOR YOUR CIVIL WAR PILGRIMAGE

BY MICHELLE CARTER

**C**hickamauga, Lookout Mountain, Missionary Ridge — They're all elite battle sites on any Civil War buff's Top 10 and all accessible from a home base in Chattanooga, Tenn. A glance at a map of Tennessee explains it all.

Chattanooga sits in the southeastern corner of the state just over the border from the nexus of Alabama and Georgia with North Carolina just 150 miles east over the Great Smoky Mountains.

Because of its strategic location and viable river and rail systems, Chattanooga served as gatekeeper to the Deep South, and both the Union and the Confederate armies sought to control the region. Some of the bloodiest and most complex battles of the Civil War were fought during the fall of 1863 on Lookout Mountain and Missionary Ridge above the Tennessee River and the Chattanooga Valley.

Union Gen. William Tecumseh Sherman, as commander of the Army of the Tennessee, used victories around Chattanooga to launch his March to the Sea through Atlanta, 100 miles southeast of Chattanooga. Those fights are replayed at the Battles for Chattanooga, a dynamic museum in a theater setting on Lookout Mountain.

The Chickamauga and Chattanooga National Military spans the borders of Georgia and Tennessee, with major units at Chickamauga,

Lookout Mountain, Missionary Ridge, Orchard Knob and Signal Point. The park is headquartered at Chickamauga Battlefield, where the meadows and woods of northwest Georgia witnessed the last major Confederate victory of the Civil War.

Should you prefer a stylized interpretation of Chattanooga's role in the War Between the States, drop by the Buttonwillow Civil War Dinner Theater in the antebellum hall of the Buttonwillow Church in Whitwell, Tenn., where the chance meet-

ing between a Union brother and his Confederate sister during the war is re-enacted. Besides the Civil War trivia and relics, you'll be treated to Southern cuisine based on authentic 19th Century recipes with desserts borrowed from the Confederate White House.

The highlight of your stay in the Scenic City will be a ride on the Incline Railway. Built in 1895, it's the world's steepest passenger train powered by two 100-horsepower engines and a pulley system. Two cars operat-

ing simultaneously pull each other up and down the mountain on a single track (except for a few yards in the middle where they double-track to pass each other).

To reach the wonders of Chattanooga, you will fly into Lovell Field (KCHA), a mere five miles from downtown. The airport offers two long runways (5,575 feet and 7,400 feet) with Av-Gas and JetA available. The FBO, Wilson Air Center, promises a courtesy van and a Hertz Rent-a-Car agency.

Pick one of Chattanooga's bed-and-breakfasts or boutique hotels for your base of operations. The city's website, ChattanoogaFun.com, can set up reservations for scores of lodgings, but pay close attention to the Garden Walk B&B Inn on Lookout Mountain or the Bluff View Inn in the downtown historical district, which features

### IF YOU GO...

**LOVELL FIELD (KCHA)**  
1001 Airport Road  
Chattanooga TN 37421  
423.855.2200  
ChattAirport.com

**WILSON AIR CENTER FBO**  
932 Jubilee Drive  
Chattanooga TN 37421  
423.855.2299  
WilsonAir.com

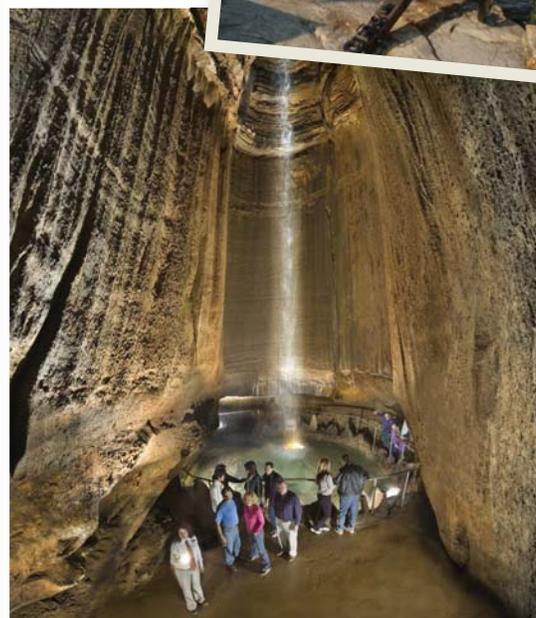
**GARDEN WALK B&B INN**  
1206 Lula Lake Road  
Lookout Mountain GA 30750  
706.820.4127  
GardenWalkInn.com

**BLUFF VIEW INN**  
411 E. Second St.  
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BluffViewInn.com

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the Bluff View Art District and the 12-mile RiverWalk pathway.

They both promise wi-fi so you could stream *Gone With the Wind* or *Lincoln* to frame your battlefield visits.



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## OVERFLYING THE GRAND CANYON? SET UP YOUR BASE CAMP IN KANAB!

BY MICHELLE CARTER

**I**s a Grand Canyon fly-over still on your bucket list? No need for you to stand firmly planted on the rim and check out the wonders before you. Pilots are blessed to be able to take in perhaps the most incredible geography on the planet — from the sky where it's ALL spread out before you. And while you're there, Zion National Park is just off to the west and Bryce Canyon National Park a bit to the north, not to mention five national monuments, two state parks and two national forests with stunning vistas in every direction. The geologic history of this remarkable red-rock region was carved out by earthquakes and volcanoes, the erosion of lakes, rivers and wind — and eons of time.

So if you've got the time, set your GPS for Kanab, Utah, perhaps the most accessible hub and base camp for your exploration of the area. Kanab's Municipal Airport (KKNB) with its 6,200-foot runway, offers all the necessary amenities including AvGas and JetA as well as an Xpress Rental Car Agency.

You may need that car if you want to do some earthbound exploring — and you will! This area of Southern Utah is famous for its numerous slot canyons — long

narrow slits cut through sandstone, with towering walls so close that you can barely squeeze through in some areas. Formed by water over thousands of years, these hairline cracks in the earth's surface are a hiker's and a photographer's paradise of tight-quartered caverns.

For all things Kanab, head to VisitSouthernUtah.com where you'll find an expansive list of lodgings from a mountain retreat overlooking Lake Powell to motor courts reminiscent of

the '50s. If you're in the mood for retro, consider the Quail Park Lodge where they've taken the roadside motel upscale with just enough of the kitsch preserved. (And they'll pick you up at the airport!) B&Bs abound in the small towns of the region, but in Kanab, you'll want the Victorian Inn with its most celebrated hot breakfasts.

Native Americans have roamed this four-corners region of the American Southwest for thousands of years. Spanish missionaries

were the first Europeans in the late 18th Century, followed not long after by Mormon pioneers who came, left and returned again to stay. But the regulars we probably know the best are the Hollywood actors of the '40s and '50s who filmed hundreds of westerns in and around Kanab. In fact, if you walk around town, you'll see hitching posts with photos of movie stars who took down gunslingers or brawled in bars along the main drag.

To overfly the Grand Canyon, get a copy of the Grand Canyon VFR Aeronautical Chart to acquaint yourself with the flight corridors in this Special Flight Rules Area that will offer magnificent vistas without infringing on the five flight-free zones.

Take careful notice of the unique corridor altitude limitations: 11,500 or 13,500 feet northbound and 10,500 or 12,500 feet southbound. And don't hesitate to contact Los Angeles Center; they're happy to help.

If your Kanab approach or departure takes you to the southeast, don't miss Monument Valley on the Colorado Plateau. Your flight will take you over the Navajos' Valley of the Rocks, the vast cluster of sandstone buttes and columns reaching 1,000 feet above the valley floor.

Breathtaking!

### IF YOU GO...

**QUAIL PARK LODGE**  
125 N 300 West  
Kanab UT 84741  
435.215.1447  
QuailParkLodge.com

**VICTORIAN INN**  
190 North 300 West  
Kanab UT 84741  
435.644.8660  
KanabVictorianInn.com

**KANAB MUNICIPAL AIRPORT (KKNB)**  
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## SIMCOM<sup>®</sup> Q&A

TRAINING CENTERS

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.*

### SUMMER 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?

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**A**t the time of this writing, the PC-12 has been certified for 20 years (FOCA March 1994 with FAA certification coming in June 1994). That's 1,250-plus aircraft later and counting. Congratulations to Pilatus Aircraft for making the best single-engine platform/performer in its class!

In 1999 while at Simcom, I began teaching the PC-12. Since then many tremendous improvements have been made to the systems, operation and interior of the PC-12 by Pilatus, Pratt & Whitney and the avionics industry. The most current production model PC-12 47/E (NG), MSN 1451 and after, now has electric landing gear, wireless data downloading and refined external lighting. But the airframe itself and its performance capabilities have basically stayed the same. The only "true" modification to the airframe has been the roll steering (affectionately called the "power steering") improvement, and the only true visual factory change has been the winglets, with two versions original Biglets or the one-third size Biglets) until the PC-12 /47 standard winglet introduction in 2005.

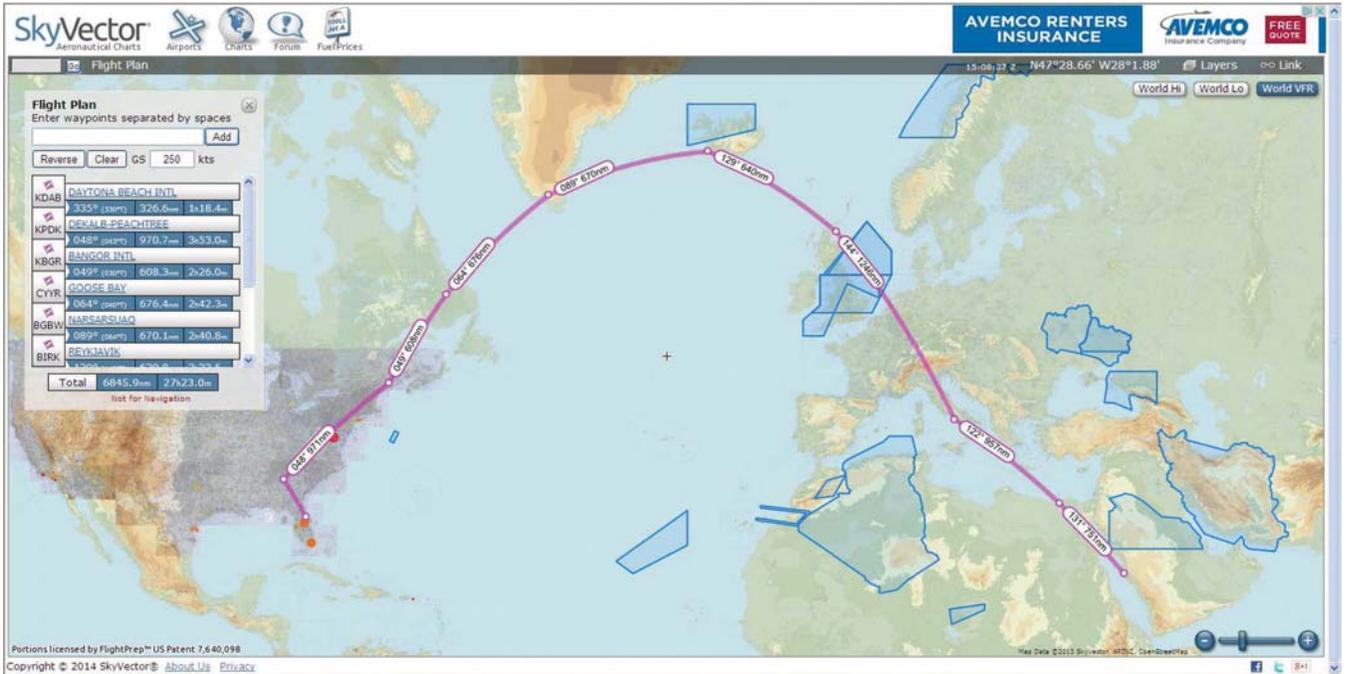
Since we are discussing performance, I thought I would share with you a couple of first experiences that I have had with the PC-12 that relate to the performance capabilities and improvements, past and present. I am intentionally going to discuss pre-12/47 Legacy PC-12s for the past/present experience. The NG does everything the Legacy PC-12s do but

gets you there in less time, carries more weight, and has the latest in avionics technology/integration (APEX) already installed. Outstanding!

One of my "firsts" took place in February 2002. I had the opportunity to fly a 90-hour new, fully factory-equipped early Series 10 (late 2001) from Mustique, St. Vincent, and the Grenadines (TVSM-2,500-foot runway) to Atlanta, Ga., for its first 100-hour inspection. I had flown privately in the Caribbean before but not in a PC-12 nor as far or from a new country of origin, roughly 1,900 nm one-way. The owner, a newly trained PC-12 pilot, requested that I fly non-stop back to Mustique from Florida, as he did not fully believe that it could be safely done. Request accepted!

Just to review the full (relevant 2001 equipment) package from the factory — single GPS King KLN 90B, full (optional) co-pilot instruments/ EFIS installation with dual AHRS, along with the dual Nav/Comm King KX 165 transceivers and the ever-important King KN 87 ADF. The weather instruments were the Standard King RDR 2000 weather radar using my still favorite MFD, the King KMD





850. No other in-flight weather info was available back in 2002.

The weather is quite good in the Caribbean during the winter months, but instrument approaches were, and still are, mostly non-GPS. The KLN 90B GPS approach database was limited to published-only GPS approaches. No airways database existed. All other approaches/waypoints had to be input manually (paper on-board, of course) for GPS-supported approach/navigation. And being the good old days, there was no Wi-Fi or other portable, aviation-related, smart stuff.

Accompanying me on the trip were two non-pilot friends of the owner. We took two days to get to Atlanta, with two stops enroute due to necessary early refueling and Customs (post 9-11), with a final

overnight in Orlando. The return trip took us back to Orlando where we stayed overnight. The following day was to be the non-stop request back to Mustique (Customs/Immigration on TVSM). With approximately no tailwind support but otherwise fair weather, we made the 1,500-plus nm trip in 6.1 hours with 600 pounds of fuel remaining.

I operate all PC-12s using the maximum cruise performance charts, and it was no different for this trip. Of course, I considered that no fuel is available at Mustique (VFR only), and that I needed enough fuel to get to the planned next day final destination of Barbados (TBPB-100 nm east) or St. Vincent (TVSV-15 nm north), both of which were alternates in case of bad weather. (Note: The return

non-stop trip from Orlando to Mustique was posted on Pilatus's website for many years as a testimonial. It is still my longest nonstop PC-12 trip.)

My latest "first" was an opportunity to fly with a new owner of an early 1997 (pre 200 MSN) PC-12 on his trip home to Jeddah, Saudia Arabia, from Daytona Beach, Fla. Normal factory configuration would have been roughly the same as the description from my previous "first" example with the exception being the original MFD at that time was another four-inch EFIS display. However, the cockpit had undergone a significant upgrade prior to this flight. Garmin G-600 PFDs were installed in both the left and right pilot positions replacing the existing EFIS only. This is not the normal conclu-



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sion to the installation but this was an unusual case.

Plus, as a result of this installation, the original AHRS were removed since each G-600 comes with its own AHRS. Also installed were the touch screen-GPS/Nav/Com Garmin GTN 750 and GTN 650. This aircraft kept the four-inch EFIS as its MFD for the radar, which is a very unusual installation.

With this present avionics upgrade, we had the entire North and South American, European and Middle East GPS waypoint database, along with all enroute High/Low airways. Also installed were all available approach charts displayable on both instrument panels. Nexrad and all available digital en-flight weather info was also installed. A "slight" improvement from 2002! However, the past is still with us on this trip, as in the Caribbean, with mostly published non-GPS instrument approaches.

This airframe had just less than 3,100 hours total time. The aircraft for both these "firsts" had the executive eight-seat configuration, though not all were

## SCHEDULE

### TVSM TO PDK TO TVSM

4 days  
Engine hours: 15.3  
Estimated distance flown: 3716 nm

### KDAB TO OEJN:

6 days  
Engine hours: 28.1  
Estimated distance flown: 6845 nm

### FUN NOTE

Great Circle direct  
KDAB to OEJN: 6205 nm

executive seats. On the Saudi Arabia trip, I had four male passengers, including two (pilots) who alternated occupying the other driver's seat with me. Along with the "stuff" brought from Daytona for the duration and the overwater gear we were to pick up, we would be operating in a Combi configuration with less than full fuel (~350 gallons).

Most of the flight planning for this long, international trip was done via one of the worldwide flight planning services, whereas I handled the Caribbean trip myself. Services would commence once we departed the U.S. The owner had also expressed a wish to arrive in Jeddah (OEJN) no later than Sunday, Dec. 9, allowing for some possible sight-seeing en route.

The mission started Tuesday, Dec. 4, 2013, departing from Daytona Beach (KDAB). One of the original items in the aircraft was a less-than-stellar NiCad battery. So as a result, with my recommendation, our first stop was to Atlanta (Epps Aviation) to replace the battery with a

Lead-Acid type. Since we were not in a hurry, we stayed the night in Atlanta.

Our plan for Wednesday, Dec. 5, was to fly to Goose Bay, Labrador, (CYR) via Bangor, Maine (KBGR) representing 1,600 nm-6+ hours, to pick up our overwater gear for the next leg. Winter weather can definitely change plans, as happened by the time we reached Bangor. A local blizzard at Goose Bay was forecast to be over by the time we would arrive, but with the alternate with Customs located over an hour away we decided to stay in Bangor. Sometimes even with the performance why chance it? So with the change of plans, the next day was to be the flight to Goose Bay for the overwater gear and then on to Reykjavik, Iceland (BIRK) — 1340 nm. And, if we were feeling lucky, we would continue on to Wick, Scotland (EGPC), only 650 nm more, to drop off overwater gear.

On Thursday, Dec. 6, we departed KBGR for Goose Bay. Upon arrival, the CYR FBO had a request to phone Scotland for a weather update from the planning desk there. When checking available weather information for the crossing to Europe, I had picked up the weather system the night before on my

laptop (times had changed from 2002) as well as an app on my smart phone. As it turned out, there were reported sustained 80-plus mph winds over the North Sea into U.K./Netherlands/Germany. Needless to say, the briefer recommended, with my complete approval, to delay arrival into Scotland for at least a day. Coupled with the time zone changes and diminishing lack of daylight, we made the decision to stay the night in Goose Bay. Another good reason to have a planning service!

On Friday, Dec. 7, we departed Goose Bay, and made a stop in Narsarsuaq, Greenland, (BGBW) after 680 nm for fuel, due to lack of wind support enroute and “iffy” weather forecasts for southern Iceland. We probably could have made it to BIRK, which was 1250 nm from CYR, with gas to spare but again, but there was no hurry and alternates get thin in Iceland if weather arrives. We departed BGBW about 2 p.m. local with sunset 3 p.m. local, and arrived in Reykjavik around 7:30 p.m. At this point, it did not look like we would make Jeddah by Sunday.

On Saturday, Dec. 8, we departed BIRK at 8:15 am for Wick, Scotland. What would have been a 175-mph tailwind the day before was now about 25/35 mph. But it was mostly smooth air, probably due to lack of winds aloft. We landed at Wick (UCT DST +1) after 640 nm, dropped off the overwater gear, refueled and refiled (intended on Ankara, Turkey, but changed plan again).

We filed and flew to Naples, Italy (LIRN). This route avoided a lingering weather system in northern Europe and offered a more direct route to our final destination (Jeddah). We departed Wick at 12:45 pm and landed Naples 7:15 pm after 1,300 nm with a 35-mph tailwind.

Fuel performance on this leg was outstanding! We burned 1,601 pounds this leg. Not bad for a 3,000-plus hour PT-6!

Sunday, Dec. 9, we departed Naples at 9:30 a.m. for Alexandria, Egypt (HEBA) at 980 nm, arriving at 2:45 pm local (UCT DST + 3). After refueling and a paperwork snafu for Jeddah (almost no problems for the trip), we departed Alexandria at 4:45 p.m. for Jeddah (OEJN). We landed in Jeddah at 8:15 p.m. local (UCT DST + 3). Mission accomplished on time!

I cannot tell you the exact amount of fuel burned for either of these trips. But I think, based on the tidbits of fuel data given, the engine performance speaks

for itself. The load capability for range purposes is still amazing, even for the pre- /47 PC12 MGW 9,921 pounds. It also does not appear that aircraft age has any impact on performance if the aircraft is given proper care, of course.

I will be posting videos from this flight and others on my website [POPA](#)

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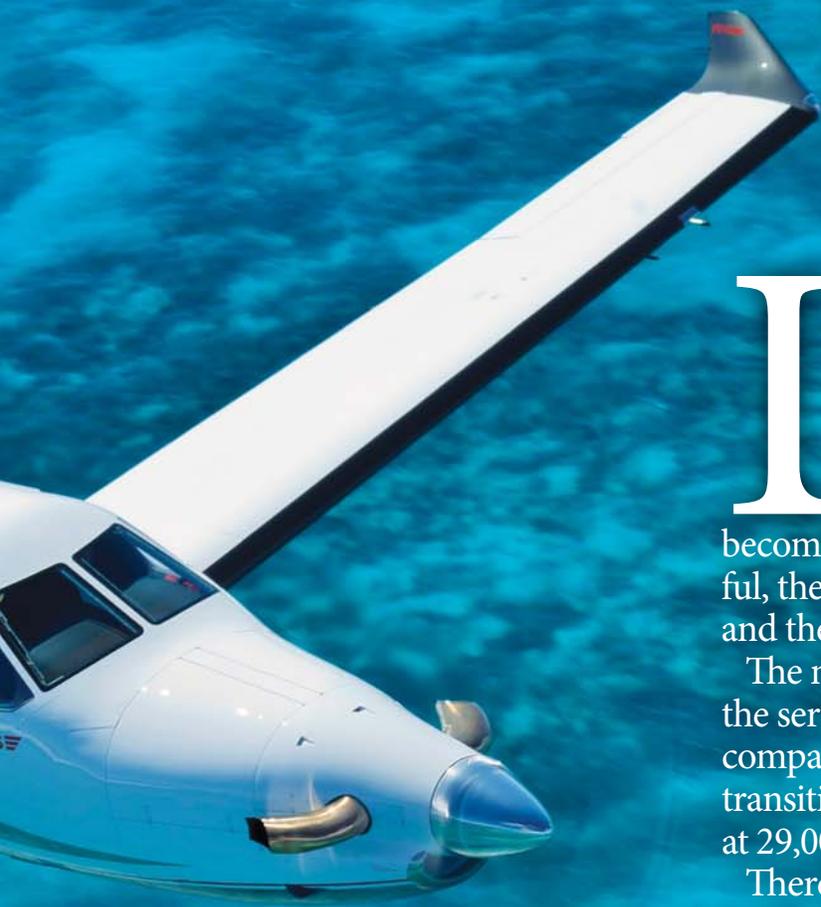
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The advertisement features a yellow helicopter with the registration N12HX on a gravel airfield. In the foreground, a yellow utility vehicle with a blue fuel tank and a yellow fuel hose is parked. The background shows a clear sky and distant mountains.



# HOW HIGH



**D**id you ever notice how success nearly always dictates higher altitude for pilots? Most civilian aviators start off in small, two-seat, piston trainers that fly in the bottom 10,000 feet of sky. As many pilots become older, more experienced and more successful, they graduate to four-seaters with extra power, and the max altitude steps up to perhaps 15,000 feet.

The next step is often turbocharging that elevates the service ceiling to 20,000 feet or higher, often accompanied by pressurization. After that, the usual transition is to turboprop power and potential cruise at 29,000 feet or above.

There's a reason turboprops do their best work up high. The atmosphere more than five miles above the sea is notably thinner than in the lower sky. That means less drag. More specifically, standard atmosphere at 25,000 feet has less than a quarter of the pressure at sea level, and at 30,000 feet, it's only about an eighth the weight of air at the seashore. In other words, atmospheric pressure decreases by about half between 25,000 and 30,000 feet. The higher you fly, the thinner the air, and the less power is required to push it out of the way.

# THE CRUISE!

**TURBOPROPS BENEFIT FROM OPERATING IN THE HIGH SKY, THE HIGHER THE BETTER.** By Bill Cox

# How high the cruise?



In a similar sense, the weather nearly always improves with altitude because the ingredients necessary to create weather become scarce. Not only is the air less dense, the thinner, colder atmosphere contains less moisture, and that translates directly to reduced cloud cover at higher altitude. It's true that the occasional summer thunderstorm can reach up into the stratosphere, but such storms are the exceptions and usually confined to the sky above high-mountain terrain.

The reduced temperature up high also makes icing less likely. At temps below minus-15 degrees C, so little humidity remains in the air that there's not much

left to freeze. You may occasionally see some cold weather frost up high, but even that becomes rare at temperatures below minus-20 C.

Clear air turbulence at high altitude is still possible, but it's improbable. We do occasionally read stories about airlines that run into CAT in the flight levels above 30,000 feet, though those encounters are becoming semi-predictable with some of the newer Doppler radars. Flying above the clouds in a clean sky with sun shining is almost guaranteed to provide a smooth ride and improve pilot and passenger disposition.

Turboprop aircraft with the capability

to operate at heights in the high 20s enjoy a number of advantages over traffic flying at lower levels. One of the primary ones is the sky can seem almost empty of other traffic. You may see a crosshatch of contrails above, but you'll rarely encounter conflicting traffic within 4,000 feet of your altitude.

Virtually all piston models (and the pending single-engine jets) are limited to 25,000 feet, and the airlines prefer to fly in the rarefied air above 33,000 feet. The temperature typically bottoms out at about minus-56 degrees C at 35,000 feet, so the airlines nearly always opt for that initial height as a compromise between

# How high the cruise?

best speed and optimum fuel burn. If conditions are favorable and the load will allow, the big jets may even drift on up to 41,000 feet as they burn down fuel load. At this height, the Boeings and Airbuses can realize good speed with minimal fuel burn, depending upon how you define "minimal."

Years ago, I was riding jump seat in a 747 coming home on South African Airways from a Caravan delivery to Johannesburg, and I asked the captain about fuel burn in the airplane some crew members jokingly call the "condominium." He gave me a short answer I'll never forget. "Most of the time in cruise, we burn about a gallon a second."

This leaves a large gap of relatively vacant sky between 25,000 and 33,000 feet where turboprops can operate with relative impunity, above most of the weather, clear of the majority of conflicting traffic and with an efficiency not possible down

*Clear air turbulence at high altitude is still possible, but it's improbable. We do occasionally read stories about airlines that run into CAT in the flight levels above 30,000 feet, though those encounters are becoming semi-predictable with some of the newer Doppler radars*

low. Most single-engine turboprops without RVSM certification must restrict their max height to 29,000 feet, but that's still a substantial improvement over flying in the bottom four/five miles of atmosphere.

The benefits are several and substantial. If you're flying eastbound in the northern hemisphere, especially in winter when the jet stream strengthens and dips farther south, you can often realize significant tailwinds, as much as 70-80 knots. If the winds aren't going your way up high, you can always opt to fly lower and slower.

I used to deliver freshly converted Malibu Jetprops from Spokane, Wash., to Europe. On several trips across the top of the U.S. to Bangor, Maine, in winter and on to Europe via Greenland and Iceland, I'd often see ground speeds approaching 350 knots, 100 knots better

than normal cruise.

Trouble is, some pilots of airplanes that can easily climb to the high 20s often find excuses to fly at lower levels no matter what the wind, often because they feel the stage length is too short or average speed will be reduced by the longer climb or the fuel savings up high will be minimal. In fact, single-engine turboprops such as

the Pilatus PC-12 can find happiness at FL290, the highest non-RVSM altitude. There are few reasons to fly lower unless there's a major inversion and temperature up high is ISA plus-20 or hotter.

Operating at 10,000 pounds gross from a sea-level airport on an ISA standard day, the Pilatus requires only 10 extra minutes to ascend to FL290 rather than

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# How high the cruise?

level at FL230. That's a small price to pay for all the advantages of taking the high road. The big Pilatus has a pressurization differential of 6.35 psi, so the airplane can maintain a cabin altitude below 10,000 feet at FL290. Fuel savings can be significant and the performance differences are barely noticeable, especially on the long stage lengths that PC-12s are noted for.

Fuel specifics suggest some major benefits. It's true the Pilatus can manage 270 knots at 20,000 feet, but fuel specifics for that height aren't nearly as optimum as at 29,000. At 20,000, you'll see a specific range of .57 nm/pound of fuel, while at 29,000 feet, speed only diminishes to just under 260 knots and specific air range jumps up to .76 nm/lb. Choose the lower altitude and you'll be sacrificing 33 percent higher fuel burn in exchange for only 4 percent more speed. Again, we're comparing performance in ISA condi-

tions at 10,000 pounds.

With such significant savings available by simply flying higher, it makes sense to ascend to tall heights on any flight over about an hour. That's the criterion the airlines use and, if it works for them, it should work for you. On the West Coast, several lines fly back and forth between Los Angeles and San Francisco a dozen or more times a day, a distance of a little over 300 nm. The airplanes that fly that route nevertheless climb to FL330-350, level for only about 10 minutes and start down. You can bet if a more efficient method existed, the airlines would adopt it. The same rules apply to Pilatus pilots.

The benefits of high-level cruise become even more impressive as the stage length increases. The PC-12 enjoys range that's superior to anything else in the class. Using the numbers above, a 1,000 nm trip would require about 250 gallons of fuel whereas

cruise over the same distance at the higher altitude would demand only 210 gallons. Using max range settings, the Pilatus PC-12 can reach out and touch destinations nearly 1,800 nm away.

Another obvious benefit of flying higher is that glide time and distance increases, providing a greater safety buffer between the airplane and the ground. Comparing glide time from 29,000 feet to that at 20,000 feet in a PC-12, you'll have about 31 minutes to glide to sea level versus 22 minutes from 20,000 feet. That extra nine minutes can make all the difference in the world.

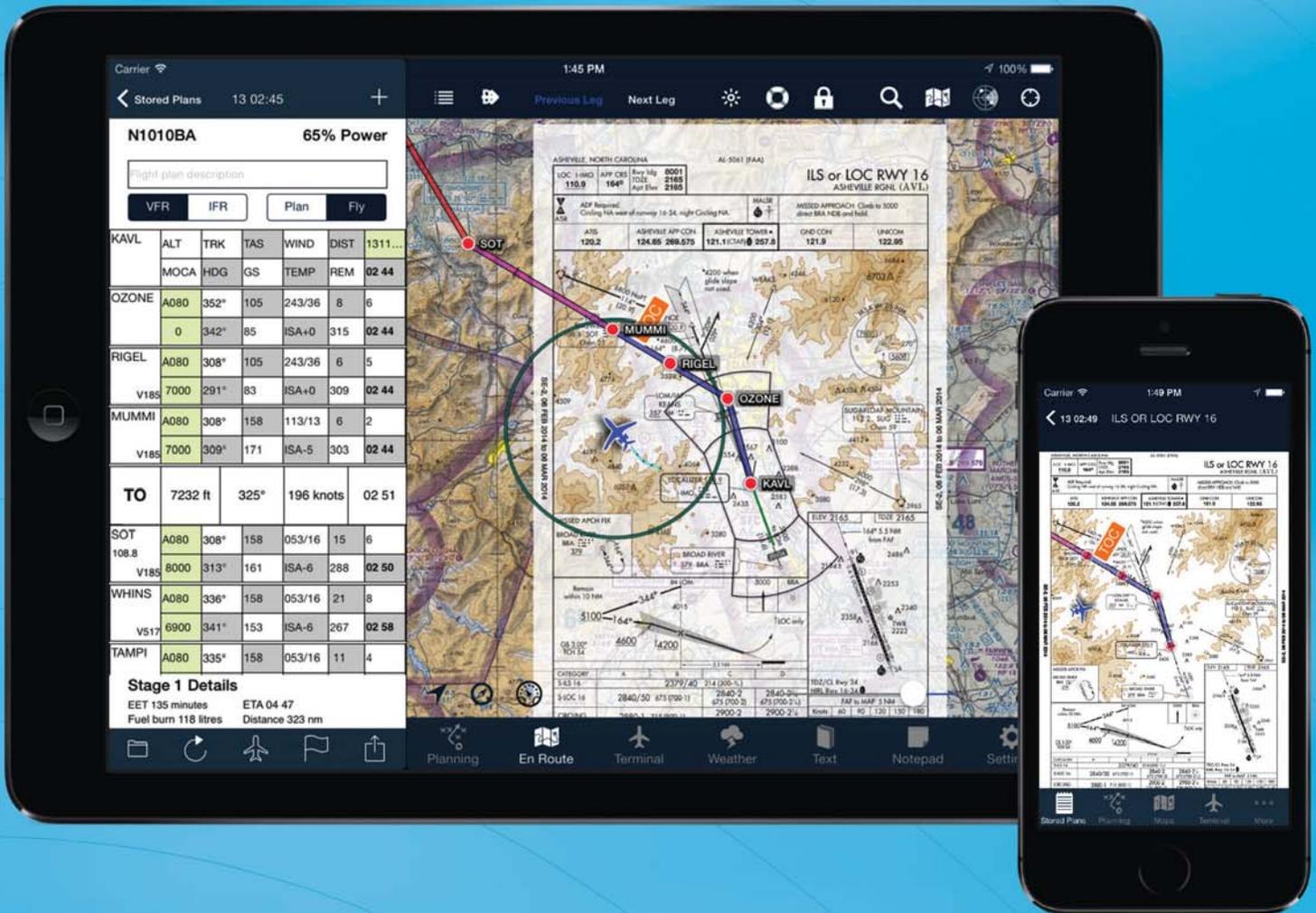
Combine increased range with the improved safety margin of high altitude, a smoother, quieter ride for pilots and passengers and the better fuel specifics that can reduce operating costs by 10-15 percent, and you'll agree that flying high offers the best of all possible worlds. 





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# Weight and Balance

{Continued from page 32} as your starting point for your future calculations.

It may seem obvious, but make sure you use the numbers for the right version of the PC-12. With some of the apps especially, it's easy to run calculations for a /47 when you really meant to calculate a /47E. For those that fly a /47E, all the screens and computers add about 100 pounds of weight and shift the CG slightly forward.

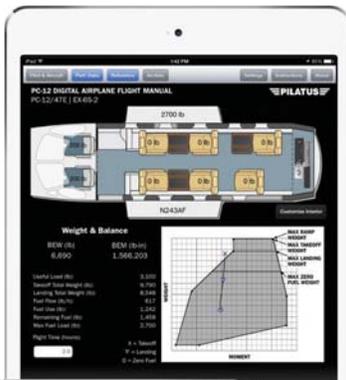
Another item for /47 or /47E aircraft that can cause issues for pilots is the **difference in takeoff and landing weights**. You might have done all you could to make sure you didn't exceed takeoff weight, but don't forget that if you took off at max gross takeoff weight, you still have to burn 529 pounds of fuel before you can land. That might be trouble if your flight is only 30 minutes long! Luckily, apps like the one from Pilatus or FltPlan.com can also calculate landing weights.

When thinking about weight-and-balance, it's easy to forget about the balance part when you never come close to max gross weight because you don't fly a lot of passengers or you fly with light bags. The balance is equally as important since being out of CG range could cause the aircraft to be uncontrollable in flight. For instance, if you commonly fly with few or no bags or passengers in back, be careful of your **CG being too far forward** if you have a lot of fuel onboard. At about 300 pounds of pilots and 2,400 pounds of fuel, the CG starts to reach the forward envelope. This is more prevalent in the /47E aircraft, but luckily it only takes the equivalent amount of luggage in back as pilots over 300 pounds to send the CG back into range. Try running a weight-and-balance next time you fly empty and see how close you come to that forward CG range.

Ending up with an **aft CG** is probably far more common, especially if you carry a lot of people, bags or cargo. Pilatus was nice

enough to mark the trim indicator with a **green diamond or line** to tell us to trim nose down to the diamond whenever the CG location is **236 inches aft of datum**.

Out of limits! Forward CG



Out of Limits! Aft CG



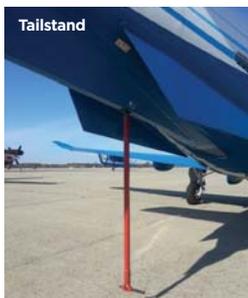
Green line = Aft CG trim 1

This will keep the aircraft from rotating too early during takeoff due to the weight in the back. Of course, you'll need to run a weight-and-balance to determine your CG location.

Other than heavy baggage, the other main cause of an aft CG is passengers. If you're flying more than four passengers, consider seating the lightest ones in the back of the aircraft and the heaviest in the front. This will help keep the CG more forward.

Another consideration of an aft CG is whether to use the **tailstand**. Under normal flights with just passengers and baggage, the **tailstand** should not be necessary

as the weight of the engine will keep the tail from falling backwards to the ground with weight in the back. To help alleviate any risk, load the baggage before loading passengers, or keep a pilot or passenger up front in the cockpit for extra forward weight. However, if you are loading cargo, such as into a cargo/passenger combination version with only four seats in the back, then the **tailstand** is a must. Also strongly consider using the **tailstand** if you are loading an aircraft with a tail covered in snow or ice before the contaminants have been removed for flight. The extra weight on the horizontal stabilizer could be enough to bring the tail down, even with a light load.



Another aircraft limitation, especially if you fly with some more "well-built" passengers or carry cargo, is **maximum zero fuel weight**. In the PC-12 it is 9,039 pounds. That is the maximum the aircraft can weigh before you add fuel. This is so you don't overload the wings with a light fuel load and heavy fuselage load during flight. In a typical executive cabin setup, this gives you about 2,500 pounds for everything you're going to carry – pilots, passengers, bags, catering. Unless you are carrying a hockey team with their bags or in a cargo configuration, it would be very unlikely that you'd come close to this number. Remember, unless you do a proper weight-and-balance, you can't prove that you did not exceed maximum zero fuel weight. The nice feature about some of the weight-and-balance applications, such as the one from Pilatus, is that they will automatically calculate and display your ZFW for you.

This all may seem like a lot of work, but the good news is if most of your flights fall under the same profile, once you've run the numbers on some common flights, you'll have a pretty good idea of whether you'll be in the CG and weight limits for future flights, especially if you've saved your weight-and-balance data. It's the oddball flights that will get you, though. Here are some rules of thumbs that might cue you that running an accurate weight-and-balance is probably a good idea:

- Compute your corrected empty weight (BEW plus pilots, charts and catering you always fly with), then add in the variables (passengers, bags, fuel). A six-seat executive interior aircraft with one pilot, charts and full catering weighs just under 7,000 pounds. You can quickly add in your passengers, bags and fuel to see whether you're coming close to max gross weight.
- Even with the maximum allowed weight in the baggage compartment, the aircraft will be within CG with fuel and pilots – until you add passengers.
- Light passengers in the back and heavy passengers in the front is the ideal loading arrangement.
- Double-check your landing weight on short flights. If you're using a graphic weight-and-balance chart, add your fuel last so you can check your landing weights for the flight, based on your fuel burn. 



Left to Right: Charlie Huggins, Pilot, and Bob Wilson, President and Founder of Wilson Air Center

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- Bob Wilson, President and Founder  
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