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VOLUME 21 NUMBER 11

2017 Holiday Gift Guide

Featuring this one-of-a-kind Paris Jet

Jet Journal: Avoiding the Gotcha's

Hydroplaning: Landing on Liquid Ice

Pilot Report: Flying the B-29 Flying Fortress

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Cyndi Nadeau, CAM
Assistant Director of Operations, KeyAir

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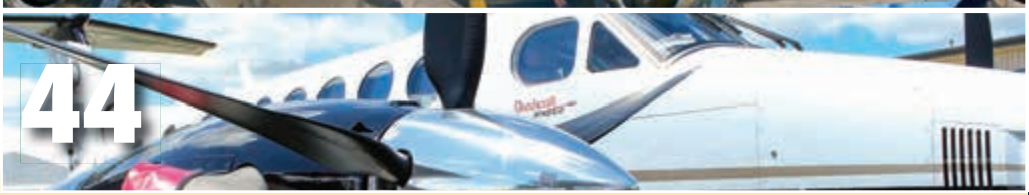

TWIN & TURBINE

EDITOR
Dianne White
(316) 213-9626
editor@diannewhite.com

EDITORIAL OFFICE
2779 Aero Park Drive
Traverse City, MI 49686
Phone: (316) 213-9626
E-mail: *editor@diannewhite.com*

PUBLISHERS
J. Scott Lizenby
Dave Moore

PRESIDENT
Dave Moore

CFO
J. Scott Lizenby

PRODUCTION MANAGER
Mike Revard

PUBLICATIONS DIRECTOR
Jake Smith

GRAPHIC DESIGN
Brett Sanders & Michael McCatty

TWIN & TURBINE WEBSITE
www.twinandturbine.com

ADVERTISING DIRECTOR
John Shoemaker
Twin & Turbine
2779 Aero Park Drive
Traverse City, MI 49686
Phone: 1-800-773-7798
Fax: (231) 946-9588
johns@villagepress.com

ADVERTISING ADMINISTRATIVE ASSISTANT & REPRINT SALES
Betsy Beaudoin
Phone: 1-800-773-7798
betsybeaudoin@villagepress.com

SUBSCRIBER SERVICES
Rhonda Kelly
Diane Smith
Jamie Wilson
Molly Costilo
Lisa Anderson
Kelly Adamson
P.O. Box 968
Traverse City, MI 49685
1-800-447-7367

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NBAA 2017: A Show of Strength

As I write this, the 2017 NBAA Convention is drawing to a close. This year's show was held in Las Vegas, which was still reeling from the horrific shooting at an outdoor music festival that left 58 dead and 500 injured just one week before. There was a subdued, but determined feeling among the Las Vegans I encountered, including several who worked at the primary FBO at McCarran International Airport. As you may have heard, the shooter targeted the GA fuel farm at the airport, but was obviously unsuccessful. The locals I spoke with felt profound sadness, some anger but, most importantly, solidarity that this tragedy cannot and would not break the city's spirit. For a town's economy that depends upon tourism and convention business, I heard time and time again: "Please come back – Vegas is standing strong, we're not going anywhere." Across the city, normally glitzy billboards carried somber messages of sympathy along with "#VegasStrong."

The events of the prior week were on the minds of everyone who walked through the doors of the Las Vegas Convention Center. During the Opening General Session, NBAA CEO welcomed Clark County Commissioner Lawrence Weekly, who spearheaded the creation of the Las Vegas Victims Fund. During his emotional address, Weekly said, *"This city looked evil in its face, and the world saw that Las Vegas is a community, a family. To the 30,000 delegates attending NBAA-BACE, I want to say thank you from our community. You don't know what it means to all of us to have you here."*

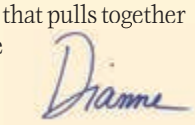
Bolen announced that NBAA Charities made a $10,000 contribution to the Las Vegas Victim's Fund and encouraged show participants to contribute as well.

This year's convention took place as debate continued in Washington over the future of the nation's ATC system. At the media breakfast held just before the show's opening, leaders from various alphabet organizations – EAA, AOPA, NATA, HAI and NBAA – held a discussion about the proposed legislation that would strip ATC oversight from Congress and hand that authority over to a private, airline-centric board, unaccountable to the public. Out on the convention floor, volunteers wearing bright red shirts emblazoned with "ATC Not for Sale" held iPads, allowing attendees to send an on-the-spot email to their congressmen. Signage, lapel stickers and other promotional items were visible throughout the exhibit hall and the static display of aircraft promoting the *www.atcnotforsale.com* website. If you haven't done so, I'd encourage you to visit the site and take advantage of communication resources there.

Overall, NBAA reported that this year's convention, which marked the 70th anniversary of the association, was one of the largest yet: 1,100 exhibitors with more than 100 new ones; approximately 100 aircraft on static display at Henderson (HND) and the convention center; and three days of well-attended educational sessions, including a single-pilot safety standdown. From my perspective, the convention floor seemed very busy, with lines forming to climb into mockups or talk to subject experts at various avionics, components and engine manufacturers.

This year's show was less about blockbuster announcements, although several new jets made their NBAA debut, including the **Pilatus PC-24** (which should certify by yearend), **Gulfstream G600** and the **Bombardier Global 7000**. Rather, the news from this year's show centered on enhancing the value of your asset (i.e. your aircraft), whether that be through safety, technology, connectivity, or creature comforts. Garmin announced its **TXi series** of touchscreen flight displays that replace the G500/G600. They also showcased their HUD (GHD 2100), which will debut on the **Citation Longitude**. Engine maker **Pratt & Whitney Canada** launched a new PT6A certified pre-owned engine program that gives in-service engines a one-year/500-hour first run warranty and other benefits. **Embraer** debuted the **Phenom 300E** featuring a beautiful new interior design, as well as inflight entertainment and cabin management system. **Tamarack Aerospace** announced that the Citation 560XL is the next airframe to undergo certification for the company's ATLAS active winglets. **Gogo Business Aviation** demoed its AVANCE L5 that operates on the Gogo 4G network. It that allows voice, data and streaming capability on board a variety of airframes from light to large cabin jets. **Jeppesen** is collaborating with Universal Avionics, Honeywell and ForeFlight to make its databases available for their products. Finally, a small company called **Polaris Aero** showcased its unique flight risk program that integrates crowd-sourced information to provide pilots real-time risk alerts (such as runway conditions, ATC quirks, and other gotcha's) based on each phase of flight.

In spite of the shadow of the Las Vegas tragedy and the continued fight to preserve a fair ATC system, the NBAA convention felt upbeat and energized. Both the city and our industry have a lot in common: we are resilient, resourceful, forward-looking and most of all, a community that pulls together at the most important moments. Just as the city is #VegasStrong, we are #GAstrong.



STOPPING, RE-INVENTED

Anti-skid braking now available for **King Air** and **Pilatus** Aircraft

PC-12 system shown

Eliminates flat-spotted and blown tires

Reduces stopping distances

Haptic feedback through pedals for optimal braking control

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Go Ahead. Stand on the Brakes.

TWIN & TURBINE'S 2017 Holiday Gift

by **Dianne White**

Whether you are looking to drop a hint, buy a gift for your favorite pilot or simply treat yourself, *Twin & Turbine* is here to help. There are plenty of pilot-oriented gadgets and gizmos out there, so we narrowed the field down to 12 unique gifts for the owner-pilot (and those who travel along) at a variety of price points. As we approach the holidays and the season of giving, we hope these selections inspire you...or at least get you dreaming of what you might find under the tree this year.

The Paris Jet: Own the World's First Business Jet and Rare Piece of History

Aviation's short history is filled with many airplanes that were fantastic performers and enjoyable to fly, but didn't find commercial success or wide market appeal. The Paris Jet is one such

Owned and offered for sale by "Mr. Paris Jet" Dave Bennett, this Paris Jet is one of only 15 remaining in the United States, and one of three that is still flown regularly.

DUSTIN BREAU PHOTO

DUSTIN BREAU PHOTO

DUSTIN BREAU PHOTO

Guide

aircraft that but never found its legs in the business aviation. Nevertheless, it a pilot's airplane. Whether you fly it for your next weekend getaway or simply make it the centerpiece of your aviation collection, this low-time Paris Jet – immaculately restored and with state-of-the-art avionics – is a gem waiting to be scooped up. For our 2017 Gift Guide, *Twin and Turbine* is proud to announce the availability for sale of this one-of-a-kind aircraft.

If you thought the Learjet was the first business jet, you'd be wrong. That honor belongs to the Morane-Saulnier MS.760 Paris, a four-place, French-built jet designed and built in the early 1950s, and marketed to business travelers in the United States by Beechcraft. This year's marque gift guide item is a beautifully restored and extremely well-equipped and appointed Paris Jet. Privately owned and maintained, this rare aircraft was once owned by the King of Morocco and pilot/actor John Travolta, who featured this bird in his movie *"Look Who's Talking."*

The Paris Jet was originally built as an ab initio jet trainer to compete for a French government contract. The revolutionary (at the time) side-by-side seating doomed the aircraft from winning the competition, so Morane-Saulnier came up with an idea that was way ahead of its time: Market the MS.760 as a business jet. In 1955, Beech Aircraft Corporation imported and FAA-certified two aircraft, intent on bringing business aviation into the jet age.

This 1959 Paris Jet was initially sold in Europe before being purchased by Santa Monica Aviation. In 1987, it was converted to a MS.760B-II, which added more fuel and the two Turbomeca Marbore VI engines producing a combined 2,116 pounds of thrust. In 2012, the panel was updated to feature Garmin G600 with synthetic vision and a touchscreen Garmin GTN 750, which is fully coupled to an STEC 55X autopilot. The beautiful leather interior with sheepskin seats were completed in 2015.

This rare bird is currently owned and offered for sale by "Mr. Paris Jet" Dave Bennett. For more information and pricing, contact Dave at *parisjet@me.com*.

Best Tugs: The Last Tug You'll Ever Need

Why move your expensive aircraft with a low-tech tug? Finally, a company has developed a digital tug that is engineered with every feature on an owner-pilot's wish list: digital speed modulation, prop protection, auto-throttle for changing grade conditions, quiet operation and even an optional air compressor. Plus, the Best Tug can easily configured to move every aircraft in your hangar, from piston to jets.

The Echo is a workhorse with a tow rating of 9,000 pounds, while the Echo XLP can move aircraft up to 12,500 pounds, but also is perfectly suited to move a Cirrus or Bonanza. The Echo features a "Prop Safe" design that guarantees that even the large props found on a TBM or Meridian will never come in contact with the tug. Every tug comes installed with a computer software optimized for the torque limitations specific of your plane to help prevent nose gear damage. The tug measures speed and torque while moving your aircraft, and the Auto Throttle can make up to 30 changes a second to maintain a constant speed, even on slopes. It also has programmed codes that will trip to prevent you from damaging your aircraft. Plus – new for 2017 – the hybrid system allows the tug's motor to act as a generator and recharge its batteries when the tug is slowing or stopping your plane.

All Best Tugs can be personalized with one of several paint schemes and can be outfitted with several options, including an LED light, underglow lighting, a fire extinguisher, USB charging ports, jump-start GPU and an air compressor.

For more information and pricing, go to *besttugs.com* or call (800) 914-2003.

The Best Tugs Echo XLP

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Factory Direct Models: A Custom Model of Your Plane

What's almost as good as the real airplane? A highly detailed, scale model of it. From a photo you provide, Factory Direct Models will create an exact replica of your plane in desktop size down to the stripe detail, registration number and personalized, engraved plaque attached to the stand. Your personalized interior can be included upon request. Each meticulously detailed scale model is custom manufactured and precisely engineered to your exact specifications. To learn more, go to *www.factorydirectmodels* or call (866)-580-8727.

Flight Outfitters' stylish new Bush Pilot Folio.

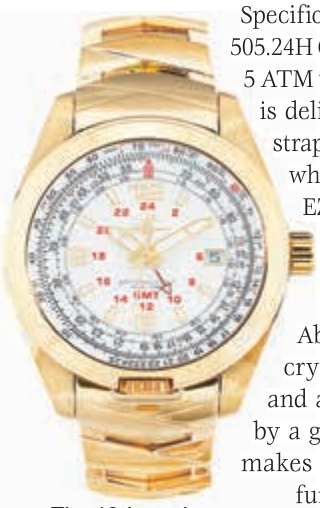
Flight Outfitters Bush Pilot Folio

Why can't a flight bag be utilitarian yet look good? Flight Outfitters says you can have both. The company's new Bush Pilot Folio has plenty of style, it's also a very practical bag, storing a surprising amount of gear without looking bulky or weighing you down. It has separate pockets for your tablet and laptop, plus a large center compartment and plenty of exterior pockets. For further utility, the Folio Bag has a rear strap to securely attach it to your roller-board.

The Bush Pilot Folio retails for $139.95 and can be found at leading online aviation retailers. For more information, go to *flightoutfitters.com*.

Special Edition Abingdon Watch for Your Favorite Aviatrix

Watchmaker Abingdon Company is celebrating its 10th anniversary by unveiling a new version of its most popular timepiece. Limited to 100 pieces only, the 24-carat gold Amelia, features a custom designed 10th anniversary case-back. The Amelia timepiece is the company's most popular watch that helped launch the company into the spotlight as the first aviation watch for women back in 2007.



The 10th anniversary special edition "Amelia" watch.

Specifications include a Ronda Swiss Made 505.24H GMT movement, 40mm case size and 5 ATM water resistance. This limited watch is delivered in a collector's box with two straps: a gold metal strap and a genuine white leather strap. Both straps have the EZ release pins on the back for a simple swap out. Authenticity paperwork with the watch's serial number and signed by the company founder, Abingdon, is also included. Sapphire crystal, date box, dual time function, and a rotating aviator's bezel controlled by a gold crown at the 6 o'clock position makes this watch not only stunning, but functional as well.

The watch is priced at $499 and will begin deliveries Nov. 3, 2017.

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MMOPA also hosts an Annual Convention and numerous fly-ins all focused on safety education, operational excellence and friendship. MMOPA gives you the opportunity to you meet other owners who share your passion for the PA46.

By joining, you'll instantly get to take advantage of special discounts on Jeppesen subscriptions and a **FREE** UVAir contract fuel card.

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Track it All on Your Garmin D2 Charlie Watch

The Garmin D2 Charlie combines aviation functions with sports watch features.

With a rich array of color mapping, weather, waypoint reference and flight logging features, the D2 Charlie sets the standard for on-wrist situational reference and backup navigation. You can pan and zoom the watch's moving map to quickly expand your view of airports, waypoints, terrain, obstacles or weather activity along your route of flight.

Wherever you travel, smart notifications (emails, text messages, alerts and more) can display on the watch to help you stay in the know while on the go. And between flights, you can use the latest sport watch features – including wrist-based heart rate monitoring, daily activity tracking, training metrics and more – to keep up with your personal fitness goals.

Priced starting at $799, you can find the D2 Charlie at many online pilot shops.

Flight Outfitters' Pilot Knife: An Emergency Essential

This knife is much more than just a blade. Designed to be the perfect emergency accessory for pilots, this knife could even save your life when in a pinch. The locking serrated blade is constructed with 440 stainless steel to cut through tough material, even through jammed harnesses. It also features a removable LED flashlight that activates with a twist of the head. A magnetic back makes it easy to mount to something when you need both hands-free. It also has a magnesium alloy fire starter, which is key to prolonged survival out in the bush.

Spring assisted for easy, one-hand operations, this knife will quickly become your go-to when in the bush. Priced at $29.95, it's available at most online pilot stores, or by going to *flightoutfitters.com*.

This multi-functional knife is an essential survival tool that should be in every pilot's aircraft.

Garmin VIRB: Capture and Create Videos Flying Flights

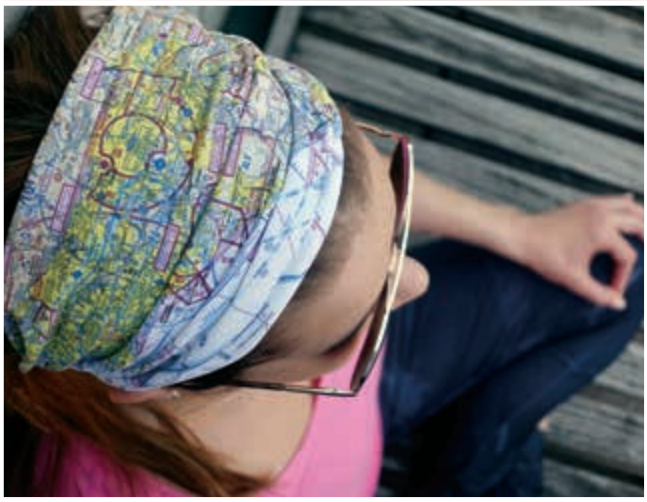
Garmin's line of VIRB cameras was designed especially for pilots, and their latest model doesn't disappoint. The powerful, easy-to-use, and compact VIRB Ultra 30 shoots ultra HD video (4K/30fps) with built-in image stabilization and GPS logging. Plus, the complete kit includes an audio cable for recording cockpit communications, a prop filter to remove distortion and mounts. It's everything you need to create amazing flying videos.

The MSRP for the VIRB 360 is $799 and can be found at many online pilot shops or purchased directly from Garmin. Go to *Garmin.com* for more information.

Base Turn: Aviation-Inspired Apparel for Your Yogi

The work of talented photographer Jessica Ambats has graced the covers of many aviation magazines. Now she has turned her creativity to a new venture: Base Turn apparel and accessories. Using images from her extensive photography catalog, Ambats

Inspired from Jessica Ambats' extensive photography portfolio, Base Turn features aviation-themed yoga apparel and accessories.



has created a fun line of yoga leggings, capris, tank tops, and accessories such as headbands and mini pouches. Other fun collections include yoga wear featuring sectional charts (you pick from several regions) and captain's stripes. She also has a line of matching toddler leggings as well.

These handmaid leggings and tops are medium weight and made of sturdy, yet breathable material. Reasonably priced, the items are available at *baseturn.com*.

Traveling doesn't mean you can't enjoy good coffee. The AeroPress produces a perfect cup every time.

Make a Great Cup of Coffee On the Road

Created by a Stanford University engineering instructor, the AeroPress is a great option for pilots because it's small, sturdy and lightweight, and it comes with a tote bag making it easy for travel. One minute with the AeroPress makes a delicious cup of coffee and a quick, light rinse cleans it up. As long as you've got a source of hot water you've got a smooth, rich cup of coffee. Also, the quick brewing process helps keep the acid level in the coffee low, meaning it's gentler on your stomach than drip or French press brew. In fact, AeroPress brewed coffee is so smooth and flavorful that many people find they love the taste even without cream or sugar.

The AeroPress is priced at $29.99 and available at amazon.com or go to *www.aeropressinc.com* to see more retailers near you.

The Bibo Barmaid makes a variety of cocktails and eliminates the hassle of leftover mixers.

Bibo Barmaid is a Mix-Saving Drinkmaker

If you often travel to a vacation or second home, you know the frustration of leaving behind perishable food and drink. Now you can enjoy your favorite cocktails without the worry of leaving partially used bottles of mixers and juices behind. Named the top kitchen gadget of the future by *Architectural Digest*, the Bibo Barmaid is cocktail self-serve machine that allows consumers to create expertly crafted mixed drinks at home with the touch of a button. If you can use a Keurig, you can make a Bibo cocktail. Simply fill it with cold water, insert a cocktail mix pouch, pull down the handle and press the "mix" button. Add your choice of alcohol, ice and a garnish.

The Bibo Barmaid and cocktail mix packets are available at Bed, Bath & Beyond, Amazon, Best Buy and others. Retail price for the system is $199.

Custom-engraved Seatbelts for Your Favorite Sleigh

Your aircraft deserves a holiday gift, too! If your seat belts are looking a bit worn, why not replace them with custom engraved lift lever lids featuring your aircraft's head-on or profile view, your company logo or even your N number. Aircraft Belts, a sister company Twin Commander Aircraft, can create customized belts for both crew and passenger seats. Call Brian Harbaugh of Twin Commander

Available for many airframe types, personalized seat belts make a great gift for your aircraft.

Aircraft at (919) 956-4385, or email him at *bharbaugh@twincommander.com*. He will be happy to help you with a quote on a stylish and distinctive set of new restraints. For more information see *www.aircraftbelts.com*. T&T

Safeguarding the "Gotcha's"

Every aircraft has its unique characteristics, which begs the question: how can this airplane hurt us?

by **Kevin Ware**

Photos by Paul Bowen and Kevin Ware

It is a short trip today: Seattle's Boeing Field (KBFI) to Boise, Idaho KBOI) in a vintage 1983 Lear 35. Less than 30 seconds after our wheels leave the pavement of runway 13R we are doing 250 knots and climbing at 4,000 feet per minute. With the power rapidly being reduced to 65 percent, we come whipping up to the Kent Seven departure procedure's climb limit of 2,000 feet. The airplane really wants to keep going up, but Seattle Departure Control has their frequency clogged with airline traffic leaving from SEATAC, which is just off to our right, and we can't get in a word edgewise. So, we roar along at 2,000 feet doing 250 knots, burning $8 worth of fuel every 15 seconds, and heading 90 degrees away from where we really want to go, with the little airplane champing at the bit like a racehorse held back at the track.

PHOTO CREDIT: PAUL BOWEN PHOTOGRAPHY

The Learjet 35 contains its fuel in two tip tanks, two wing tanks and an aft fuselage tank. The fueling process requires special care that one tip tank is not filled while the other remains empty.

Despite all this fuel-thirsty, thoroughbred performance, and contrary to what you may have heard, Learjets are quite easy to fly. They have nicely balanced controls, go exactly where you point them, and have fighter-like acceleration and climb rates. It is hard to believe they were originally designed back in the early 1960s when most of us were still in high school or college. And yet, although the older models will do just about everything newer versions of the airplane will do, they have a reputation among pilots for some peculiar, mostly "age of design"-related operational issues, many of which can be fatal if you do not pay careful attention. In the vernacular of pilots, these become known as "gotcha's."

Avoiding the Gas Gaffe

Well before you board the aircraft, the Lear 35 "gotchas" start with the fuel system. The big TFE731 fanjets on these little airplanes each put out 3,500 pounds of thrust and use so much fuel that the engineers had trouble finding places to put it all. Just over 900 gallons can be boarded, and it is stashed all over the place. There is the equivalent of seven 50-gallon drums (1,175 pounds or 172 gallons on each side) in the wing tip tanks.

Inboard of each tip tank, squeezed into each of the small thin wings, there is another 1,254 pounds (a bit over 180 gallons a side). Finally, behind the baggage area aft of the rear passenger seat, there is a tank the size of a cattle watering trough called "the trunk," which holds another 1,340 pounds or just under 200 gallons. The little jet, which has a basic operating weight of 10,700 pounds, takes off with just under 7,000 pounds of fuel on board.

With tanks scattered all over the airplane, filling them safely becomes a procedure that the pilots pay careful attention to. Unlike newer business jets, which nearly all have single-point refueling, the only way to fuel a Lear 35 is via the fuel ports in each tip tank where it flows by gravity into the wing tank on the same side. You must watch that the line guys do not fill up one tip tank while the other is empty, as that will cause a fuel imbalance of over half ton. Given the relatively narrowly spaced landing gear, this will tip the airplane literally up on its side. In addition, there is no way to place fuel into the fuselage or "trunk" tank from outside the aircraft. That tank can only be filled by transferring fuel from the wing and tip tanks via on board electric fuel pumps. It's a time-consuming activity that usually requires the aircraft be powered up, and is normally done before landing or as the airplane taxis in.

After the line guys are done filling the tip and wing tanks, you absolutely must check each of the fuel caps for security. There is just one on each side, they look almost identical to those on a Cessna 310, lie on the outboard side of the tip tank and so cannot be seen from inside the airplane. If the left is less than fully fastened, they can depart the aircraft in flight, which will cause all the fuel on that side (literally a ton), to be completely siphoned out into the slipstream within a period of minutes. This in turn will cause the engine on that side to fail, and creates a lateral 2,400-pound fuel imbalance that makes the aircraft non-controllable around the horizontal axis. This "gotcha" is this reason you will find at least one of the pilots of a good Lear crew to be physically present during any fueling, and even after that, at least one of them will walk around the airplane and literally touch each of the two fuel caps before boarding. Personally, I check them twice.

Close the Door Already!

While still on the ground, the next "gotcha" with potentially fatal consequences is the cabin door closing mechanism. The complex process required to close the door has more steps than that needed to start the engines. Screw it up and a loss of pressurization could occur, which at the altitudes at which the airplane is capable of operating could easily prove fatal.

The process begins with pulling the lower half door up to a temporary lock

position using a T handle attached to a cable, while the upper half is still open. The lower door is then locked in place with a rotary handle, then the upper half pulled down. One then activates a hook driven by an electric motor contained within the lower door itself, to cinch down the upper door. The motor is controlled by a small, very hard-to-find toggle switch lost in the upholstery, located on the forward side of the lower entry door. Looking lost and muttering under your breath while you are groping for the switch, does not enhance the image of your piloting skills to the two pax sitting less than 4 feet away.

Once the doors are cinched together by the electrically powered hook, the upper door handle can be thrown over into the fully locked position. The electric motorized hook, however, is still holding the door fast, which would make exit during an emergency evacuation impossible. Thus, the next step is to reverse the hook's motor, in the process disconnecting the hook entirely. The final step is to call out "door closed," while your buddy sitting in the cockpit with the master switch on checks to make sure the "door" annunciator panel light has gone out, at which time he says, "light out." Miss a single step and the light remains on, which causes the passengers to wonder just how good of a crew you are, if you can't even figure out how to close the door. Luckily, we know the drill, so with the door now closed, the engines are started, which is a relatively simple task.

Stay Out of the Grass

Now it is time to taxi the aircraft and another potentially embarrassing "gotcha" presents itself: the nose-wheel steering. This system is operated through the rudder pedals, but is electrically driven by a motor that has variable authority depending upon aircraft speed. From a practical point of view, this means that the pilot (at least until very familiar with the airplane), can never quite tell how much the nose wheel will turn for a given amount of rudder pedal movement. In addition, small inputs to the rudder pedals result in the system making a squealing sound similar to that of a pig being castrated, which in all its unpleasantness is clearly audible to the passengers.

The partially-hidden toggle switch (pictured at right) operates an electrically operated hook that latches the clamshell door together (above). Not following proper door-closing procedure will lead to a potentially dangerous "gotcha."

All this has many new Lear 35 pilots lurching down the taxiway, with the repeated odd noise clearly announcing to the passengers that the pilot must be new to this aircraft. This continues through the initial part of the takeoff run, when at 45 knots the nose-wheel steering becomes dangerously sensitive so it is turned off via a red button on the control wheel.

The CRM drill to prevent an off-runway excursion "gotcha," goes like this: Pilot flying (PF) advances the throttles PNF calls "*power set*," then at about 45 knots "*airspeed alive*," at which time PF presses the red button on the control wheel and calls out, "*nose wheel steering off*." On landing, serious accidents have occurred if the nose-wheel steering is "ON" at touch down because even a small amount of rudder input (say, a slight slip for crosswind purposes) will move the nose wheel well off center. Thus, when it meets the pavement, the nose wheel immediately points the airplane toward the grass. For this reason, the nose wheel steering is left OFF on landing, and kept that way until the airplane is well slowed down, something that is not at all intuitive.

Old School TOLD Calculations

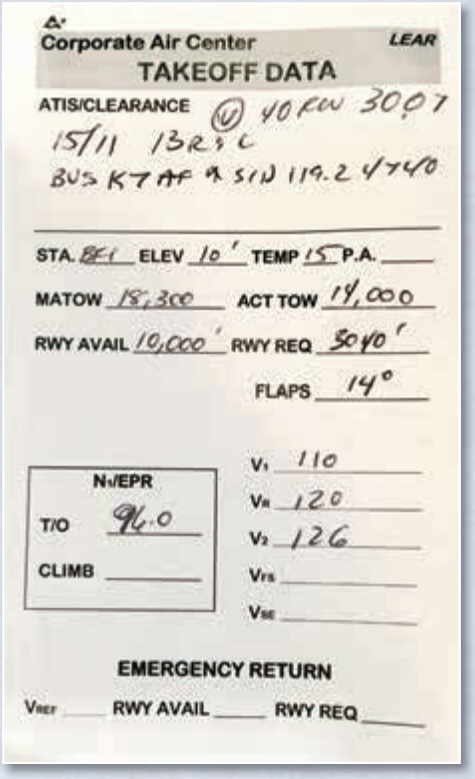
Nearing the runway and ready to fly, the next potential "gotcha" is the need to use TOLD (takeoff and landing data) cards. In newer jets, this information is automatically calculated by the onboard computer, and moved to the PFD (primary flight display), but this convenience is not available on the older Lear 35s. Pilots must look up the required speeds (V_1, V_r, and V_2), runway length, and power settings for each takeoff. The numbers are dependent upon temperature, weight, runway condition and elevation.

Most of us have made up charts for the common numbers, and pasted them to the checklist, but it still can be tricky. For example, for Boise today, (elevation 2,871 feet), the readily available chart is not valid because it is for sea level operations only, so a larger book is consulted for the numbers applicable to that elevation. Usually the charts in the larger book never show the exact altitude and temperature you are at, and so some extrapolation is required.

Once the takeoff or landing information has been extracted from the charts, to make it readily apparent to the crew it is hand printed on a TOLD card and stuck somewhere obvious for both pilots to see.

A Gotcha-Free Landing

We have been blasting along at 2,000 feet and 250 knots on our BFI departure for several minutes when we finally get a word in edgewise with Seattle Departure and are given a left turn and climb to 12,000 feet. We arrive there in less than three minutes and meet with our next "gotcha." Most of these older Learns do not have altitude preselect on either the flight director or the autopilot. As a result, both pilots need to be fully alert during the climb,



While the flight decks in newer jets can perform the takeoff data calculations, the Learjet 35 requires the pilot to acquire and display the data the old-school way.

because when doing 4,000 feet per minute, with the usual "1,000 feet to go" CRM call out, you have less than 15 seconds to get the climb rate under control or an altitude bust is almost a certainty.

Luckily, on our flight to Boise today, we nail the altitude, and with fuel caps staying in place and the cabin door remaining closed, we do just fine as we climb to FL390 to happily discover a 100-knot tail wind. Twenty minutes later we are at the TOD (top of descent) for our approach into Boise. During the decent we dial up the local ATIS, then look up the TOLD numbers for the airplanes weight, plus temperature and altitude of the airport. We make a good landing being sure the nose wheel steering remains turned off. We turn the nose wheel steering on as we exit the high-speed turnoff, and while taxiing to the FBO have the foresight to transfer fuel from the wing to the "trunk" tank in the aft fuselage.

Forty-eight minutes after leaving BFI, and having luckily avoided all the "gotcha's," we park the airplane on the ramp at BOI, borrow a crew car and head out for breakfast thinking, "What great airplanes those Lear 35s." T&T

Kevin Ware is an ATP who also holds CFI, MEII and helicopter ratings, has more than 10,000 hours and is typed in several different business jets. He has been flying for a living on and off since he was 20, and currently works as a contract pilot for various corporate operations in the Seattle area. When not working as a pilot he is employed part time as an emergency and urgent care physician. He can be reached at kevin.ware2@aol.com

The Pilatus PC-24, which is the first business jet designed to take off and land on unpaved runways, undergoes water pond testing. Although turbine aircraft undergo testing under extreme conditions, no aircraft is immune to hydroplaning, especially if not flown at the proper speed.

PILATUS AIRCRAFT PHOTO

Landing on Liquid Ice

No aircraft is immune to hydroplaning. Know your hydroplane speed, plan ahead and use good technique when landing on wet surfaces.

by **Thomas P. Turner**

A light jet overran the runway at Chicago Midway Airport in mid-July. Perhaps because the new-model jet was the first of its type delivered to a customer, images of the aftermath received widespread distribution in aviation-oriented media. Preliminary reports state: "Information from video footage and ADS-B data suggest that the aircraft landed on Runway 31C and steered off the left side of the runway just before reaching the Engineered Material Arrestor System (EMAS) pad at the end of the runway."

Light rain was reported at the time of the overrun, and the pavement in the photo appears quite wet. Witnesses state it had rained heavily before the jet, arriving from Philadelphia, attempted landing on the 5,141- by 150-foot (1567 by 45.7 meter) Runway 31C. The FAA's *Airplane Flying Handbook* tells us:

Dynamic hydroplaning occurs when there is a film of water on the runway that is at least one-tenth inch deep. As the speed of the airplane and the depth of the water increases, the water layer builds up an increasing resistance to displacement, resulting in the formation of a wedge of water beneath the tire. At some speed, termed the hydroplaning speed (VP), the water pressure equals the weight of the airplane and the tire is lifted off the runway surface. In this condition, the tires no longer contribute to directional control and braking action is nil.

Dynamic hydroplaning is related to tire inflation pressure. Data obtained during hydroplaning tests have shown the minimum dynamic hydroplaning speed (VP) of a tire to be 8.6 times the square root of the tire pressure in pounds per square inch (PSI). For an airplane with a

main tire pressure of 24 pounds, the calculated hydroplaning speed would be approximately 42 knots.

It is important to note that the calculated speed referred to above is for the start of dynamic hydroplaning. *Once hydroplaning has started, it may persist to a significantly slower speed* depending on the type being experienced.

Reverted rubber (steam) hydroplaning occurs during heavy braking that results in a prolonged locked-wheel skid. Only a thin film of water on the runway is required to facilitate this type of hydroplaning. The tire skidding generates enough heat to cause the rubber in contact with the runway to revert to its original uncured state. The reverted rubber acts as a seal between the tire and the runway, and delays water exit from the tire footprint area. The water heats and is converted to steam which supports the tire off the runway.

Reverted rubber hydroplaning frequently follows an encounter with dynamic hydroplaning, during which time the pilot may have the brakes locked in an attempt to slow the airplane. Eventually the airplane slows enough to where the tires make contact with the runway surface and the airplane begins to skid.

The remedy for this type of hydroplane is to release the brakes and allow the wheels to spin up, then apply moderate braking. Reverted rubber hydroplaning is insidious in that the pilot may not know when it begins, and it can persist to very slow ground speeds (20 knots or less).

Viscous hydroplaning is due to the viscous properties of water. A thin film of fluid no more than one-thousandth of an inch in depth is all that is needed. The tire cannot penetrate the fluid and the tire rolls on top of the film. This can occur at a much lower speed than dynamic hydroplane, but requires a smooth or smooth acting surface such as asphalt or a touchdown area coated with the accumulated rubber of past landings. Such a surface can have the same friction coefficient as wet ice.

When confronted with the possibility of hydroplaning, it is best to land on a grooved runway (if available). Touchdown speed should be as slow as possible consistent with safety. After the nosewheel is lowered to the runway, apply moderate braking. If deceleration is not detected and hydroplaning is suspected, the nose should be raised and aerodynamic drag utilized to decelerate to a point where the brakes do become effective.

Apply brakes firmly until reaching a point just short of a skid. At the first sign of a skid, release brake pressure and allow the wheels to spin up. Maintain directional control as possible with the rudder.

In a crosswind, if hydroplaning should occur, the crosswind will cause the airplane to simultaneously weathervane into the wind as well as slide downwind.

Under Pressure

NASA has tested the hydroplaning phenomenon extensively. It publishes a table that correlates tire pressure to the speed at which dynamic hydroplaning will occur. Note the main wheel tire pressure for the airplane you're flying, and compare that pressure to the actual touchdown speed, which should be very close to the stalling speed as adjusted for airplane weight. You may find that your normal landing puts you close to a hydroplaning speed.

Tire Pressure (psi)	Hydroplaning Speed (kts)
30	49
40	57
50	64
60	70
70	75
80	81

(*above*) Tire Pressure versus Hydroplaning Speed (NASA)

There is extremely little margin between the full-stall, essentially short-field landing touchdown speed and the NASA hydroplaning speed. You need to be *very careful* and land *much slower* than many pilots routinely land to avoid hydroplaning on a wet runway in an airplane like that!

Note that these are *groundspeeds*, the speed the airplane's tires are traveling across the wet surface. This becomes important as we return to the case of the Midway light jet.

Wet Runway

METARs around 1836Z, the time of the mishap, are listed below. I've highlighted some important information.

KMDW 121853Z 18009G17KT 10SM -RA FEW060 BKN110 BKN130 OVC200 23/21 A2991 RMK AO2 LTG DSNT NE SLP120 P0007 T02280211 $

KMDW 121753Z 21011KT 10SM -RA FEW040 SCT090 BKN120 OVC200 23/21 A2996 RMK AO2 LTG DSNT ALQDS RAB37 SLP135 P0001 60060 T02280206 10256 20206 51006 $

KMDW 121653Z 20011KT 10SM FEW045 SCT060 BKN110 OVC150 23/21 A2995 RMK AO2 LTG DSNT W AND NW RAE41 TSE09 SLP133 P0001 T02280211

The light jet, landing on Midway's Runway 31C, touched down with a variable and at times gusty wind. 100 degrees to as much as 130 degrees off the runway heading, a crosswind-to-tail wind landing. The trend established by the NASA Tire Pressure versus Hydroplaning Speed table, suggests this to be a potential contributing factor, and certainly enough to remind us to think about dynamic hydroplaning in any airplane we fly.

Mitigation

To minimize the hazard of hydroplaning when landing on a wet runway:

- Fly the proper touchdown speed as slowly as possible to just above the stall speed at the moment of touchdown to preserve a hydroplaning speed margin.
- Land aligned with the runway centerline with zero sideslip using

One-tenth inch of water on a runway is all that is needed to induce dynamic hydroplaning.

Fly the proper touchdown speed and aligned with the runway centerline with zero sideslip using appropriate crosswind control inputs. Plan a "firm" but smooth arrival, to put the tires solidly against the pavement.

appropriate crosswind control inputs. This is a basic requirement for passing the Private, Recreational and even Light Sport Pilot check ride, so it should be your routine for all landings, and then all your landings become good practice for landing on a wet runway.

- Touch down as close to the approach end of the runway as possible to maximize available landing distance. We normally aim for the touchdown zone markers, which are usually 1,000 feet from the runway threshold. But that reduces available stopping distance by 1,000 feet. In the case of Midway's 31C that make it effectively a *4,141*-foot runway, about 20 percent less stopping distance when hydroplaning is a risk.
- Plan a "firm" but smooth arrival, to put the tires solidly against the pavement. Don't try to "grease it on" if the runway is wet.
- Hold the elevator after touchdown to maximize aerodynamic braking. But when the nose does come down, don't push the wheel down and cause the airplane to wheelbarrow, or induce a pilot-induced oscillation.
- Avoid applying brakes at or above the NASA-critical speed for your airplane. Land at a speed and with remaining runway distance that permits coming to a stop with little or no braking. Once below hydroplaning speed for your airplane, brake firmly without causing the tires to skid. Treat a wet runway like you'd treat one with a film of ice.
- Execute an immediate go-around if you detect hydroplaning upon touchdown, unless you have a runway *much* longer than your computed landing distance with a very healthy margin.
- Divert to a more suitable airport if a wet runway is combined with a significant crosswind or component. You might hydroplane off the side or end of the runway.
- Some pilots advocate retracting flaps to put more weight on the wheels, increasing braking and directional control. Attempting to retract flaps during the landing roll is a common cause of inadvertent landing gear retraction in retractable gear airplanes. I recommend against this practice in retractable gear airplanes.

Hydroplaning is one of those things we read about but we really can't practice unless we're doing it for real. Any time the runway is wet, think about the possibility of dynamic hydroplaning and adjust your technique to avoid the threat. T&T

Thomas P. Turner is an ATP CFII/MEI, holds a master's Degree in Aviation Safety, and was the 2010 National FAA Safety Team Representative of the Year. Subscribe to Tom's free FLYING LESSONS Weekly e-newsletter at www.mastery-flight-training.com.

FIVE on the FLY

by **Rebecca Groom Jacobs**

WHO:
Bart Jones

WHERE:
Vero Beach, FL

POSITION:
Piper Aircraft Chief Pilot,

Senior Manager of Production Flight Test

CAREER HIGHLIGHTS:
Ratings: Seaplane, Tailwheel, Single-Engine Commercial and Multi-Engine ATP

Hours: 10,000+

1. You've been at Piper more than 28 years. Can you describe your start at the company?

I was hired into the training department in 1989, back when Piper used to perform all piston training in-house, with both new and old aircraft. Stuart Millar, Piper's owner at that time, held the belief that we needed to train in *all* airplanes because of the intangible benefits – can't put a dollar figure on accidents you don't have. So, during my first five years I provided type-specific training to pilots in Senecas, Aerostars, Saratogas, Cherokees, Seminoles, Super Cubs, Malibus and others. It was a really fun time, and I met a lot of great people I am still friends with today.

2. What are your current responsibilities within the company?

I am the chief pilot, as well as senior manager of production flight test. I am essentially responsible for anyone who flies within the company with the exception of engineering test flight. I also act as the corporate pilot, check out sales pilots, perform demo flights, transport aircraft to trade shows, etc. But I spend the bulk of my time flying production test flights across the whole product line. Each aircraft has its own extensive flight test procedure designated by the FAA prior to certification. We are the ones who verify it meets those operational standards.

3. In your career, what have been some of the biggest shifts in the industry?

I'd say the growth in avionics and cockpit automation has been the biggest shift. Airplanes have not changed all that much otherwise. But the automation has made both airplanes and pilots different. The whole attitude of flying is different. Back when I started, you didn't expect the autopilot to work and now it's a shock if it doesn't. With GPS, flight planning has dramatically changed as well – it takes a lot less pilot input. Cost is another shift, but I have my own theory on that topic.

4. Can you elaborate on your cost theory?

There is this feeling now that flying costs more than it should since it was a lot cheaper back in the 1950's, 60's, and 70's. That's the time a lot of us grew up in. But if you go back farther than that and look at private flying in the 1930's and 40's, relatively speaking it was as expensive, if not more, than it even is now. I honestly think the era between the end of WWII through the early 1980's was the anomaly and what we are experiencing now is the norm. It's an interesting way to look at it.

Piper's most recently debuted model is the M600. What sets it apart from other M-Class models?

The range and payload. With 260 gallons of fuel, you have six hours of range plus the ability to offload a significant amount of fuel and still have more range than you need on an average-length trip. It's a clean-sheet wing, making it a completely different performing airplane. Usually, with smaller turbine-engine aircraft, you are compromised with range/payload, but Piper has cracked the code with this one. T&T

Jacobs is a private pilot and general aviation enthusiast. In 2012, she earned her business degree in marketing from Oklahoma State University. Since then, she has specialized in aviation-specific marketing, working first for Piper Aircraft, and then as an aviation marketing specialist at Sullivan Higdon & Sink. Jacobs is now serving as the Director of Communications at the consulting firm Groom Aviation. You can contact Rebecca at rebecca@groomaviation.com.

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30	ASTRA 1125SP
53	ASTRA 1125SPX
42	BEECHJET 400
244	BEECHJET 400A
126	BOEING BBJ
373	CHALLENGER 300
53	CHALLENGER 600
41	CHALLENGER 601-1A
112	CHALLENGER 601-3A
52	CHALLENGER 601-3R
295	CHALLENGER 604
9	CHALLENGER 800
183	CITATION 500
298	CITATION 525
269	CITATION BRAVO
155	CITATION CJ1
84	CITATION CJ1+
206	CITATION CJ2
169	CITATION CJ2+
360	CITATION CJ3
63	CITATION CJ3+
222	CITATION CJ4
146	CITATION ENCORE
46	CITATION ENCORE+
299	CITATION EXCEL
19	CITATION I
249	CITATION I/SP
463	CITATION II
60	CITATION II/SP
163	CITATION III
44	CITATION LATITUDE
140	CITATION M2
377	CITATION MUSTANG
126	CITATION S/II
256	CITATION SOVEREIGN
61	CITATION SOVEREIGN+
238	CITATION ULTRA
238	CITATION V
29	CITATION VI
94	CITATION VII
254	CITATION X
24	CITATION X+
210	CITATION XLS
205	CITATION XLS+
1	DIAMOND I
46	DIAMOND IA
3	DORNIER ENVOY 3
230	ECLIPSE EA500
41	EMBRAER LEGACY 500
133	EMBRAER LEGACY 600
60	EMBRAER LEGACY 650
235	EMBRAER PHENOM 100
239	EMBRAER PHENOM 300
84	FALCON 10
22	FALCON 100
21	FALCON 200
174	FALCON 2000
21	FALCON 2000EX
68	FALCON 20C
16	FALCON 20C-5
24	FALCON 20D
2	FALCON 20D-5
30	FALCON 20E
9	FALCON 20E-5
71	FALCON 20F
68	FALCON 20F-5
206	FALCON 50
7	FALCON 50-40
92	FALCON 50EX
150	FALCON 900
23	FALCON 900C
103	FALCON 900EX
180	GLOBAL 5000
128	GLOBAL EXPRESS
19	GULFSTREAM G-100
207	GULFSTREAM G-200
9	GULFSTREAM G-300
21	GULFSTREAM G-400
285	GULFSTREAM G-450
9	GULFSTREAM G-500
462	GULFSTREAM G-550
70	GULFSTREAM G-II
24	GULFSTREAM G-IIB
140	GULFSTREAM G-III
169	GULFSTREAM G-IV
282	GULFSTREAM G-IVSP
172	GULFSTREAM G-V
36	HAWKER 1000A
10	HAWKER 125-1A
5	HAWKER 125-1AS
6	HAWKER 125-3A/RA
11	HAWKER 125-400A
22	HAWKER 125-400AS
12	HAWKER 125-400B
12	HAWKER 125-600A
6	HAWKER 125-600AS
107	HAWKER 125-700A
56	HAWKER 4000
193	HAWKER 400XP
33	HAWKER 750
191	HAWKER 800A
34	HAWKER 800B
352	HAWKER 800XP
35	HAWKER 800XPI
80	HAWKER 850XP
148	HAWKER 900XP
7	JET COMMANDER 1121
4	JET COMMANDER 1121B
1	JETSTAR 6
6	JETSTAR 731
12	JETSTAR II
10	LEARJET 23
17	LEARJET 24
2	LEARJET 24A
14	LEARJET 24B
39	LEARJET 24D
10	LEARJET 24E
7	LEARJET 24F
16	LEARJET 25
39	LEARJET 25B
10	LEARJET 25C
100	LEARJET 25D
4	LEARJET 28
29	LEARJET 31
167	LEARJET 31A
33	LEARJET 35
380	LEARJET 35A
13	LEARJET 36
33	LEARJET 36A
29	LEARJET 40
194	LEARJET 45
174	LEARJET 45XR
99	LEARJET 55
4	LEARJET 55B
12	LEARJET 55C
261	LEARJET 60
478	PILATUS PC-12/45
111	PREMIER I
7	SABRELINER 40
19	SABRELINER 40A
2	SABRELINER 40EL
1	SABRELINER 40R
24	SABRELINER 60
1	SABRELINER 60AELXM
19	SABRELINER 60ELXM
3	SABRELINER 60EX
68	SABRELINER 65
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6	SABRELINER 80SC
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5	WESTWIND 1123
32	WESTWIND 1124
65	WESTWIND 2

Turboprops – 10,774

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1,202	CARAVAN 208B
2	CARAVAN II
32	CHEYENNE 400
132	CHEYENNE I
13	CHEYENNE IA
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106	KING AIR A90-1
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885	KING AIR B200
95	KING AIR B200C
8	KING AIR B200CT
95	KING AIR B200GT
4	KING AIR B200SE
22	KING AIR B200T
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347	KING AIR C90
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358	KING AIR C90B
82	KING AIR C90GT
96	KING AIR C90GTI
125	KING AIR C90GTX
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21	MERLIN III
28	MERLIN IIIA
45	MERLIN IIIB
18	MERLIN IIIC
5	MERLIN IV
9	MERLIN IV-A
9	MERLIN IV-C
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26	MITSUBISHI MU-2F
18	MITSUBISHI MU-2J
33	MITSUBISHI MU-2K
11	MITSUBISHI MU-2L
18	MITSUBISHI MU-2M
18	MITSUBISHI MU-2N
25	MITSUBISHI MU-2P
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70	SOCATA TBM-700B
293	SOCATA TBM-850
101	SOCATA TBM-900
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37	TURBO COMMANDER 690
141	TURBO COMMANDER 690A
144	TURBO COMMANDER 690B
83	TURBO COMMANDER 840
26	TURBO COMMANDER 900
55	TURBO COMMANDER 980

Twin Piston – 6,961

Owners

Count	Aircraft
39	BARON 56 TC
1,459	BARON 58
3	BARON 58 PA
351	BARON 58P
112	BARON 58TC
3	BARON A56TC
301	BARON G58
197	BEECH DUKE B60
176	CESSNA 340
531	CESSNA 340A
90	CESSNA 402B BUSINESS LINER
140	CESSNA 402C
29	CESSNA 404 TITAN
266	CESSNA 414
363	CESSNA 414A CHANCELLOR
49	CESSNA 421
41	CESSNA 421A
362	CESSNA 421B
610	CESSNA 421C
53	CESSNA T303
116	PIPER 601P AEROSTAR
25	PIPER 602P AEROSTAR
488	PIPER CHIEFTAIN
24	PIPER MOJAVE
835	PIPER NAVAJO
16	ROCKWELL 500 SHRIKE
27	ROCKWELL 500A SHRIKE
82	ROCKWELL 500B SHRIKE
47	ROCKWELL 500S SHRIKE
5	ROCKWELL 500U SHRIKE
16	ROCKWELL 520 COMMANDER
7	ROCKWELL 560 COMMANDER
15	ROCKWELL 560A COMMANDER
13	ROCKWELL 560E COMMANDER
8	ROCKWELL 560F COMMANDER
17	ROCKWELL 680 SUPER
7	ROCKWELL 680E
13	ROCKWELL 680F COMMANDER
17	ROCKWELL 680FL GRAND COMMANDER
8	ROCKWELL 680FLP GRAND LINER

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59	CESSNA 206
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21	CESSNA P210R
54	CESSNA T182
1	CESSNA T206
751	CIRRUS SR20
2,905	CIRRUS SR22
241	PIPER MALIBU
468	PIPER MIRAGE

38,967 TOTAL AIRCRAFT

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Flying the Fortress

by **Doug Rozendaal**

Editor's Note: One of the highlights of EAA AirVenture 2017 was witnessing two B-29s flying together for the first time since they were in military service more than 50 years ago. Longtime Twin & Turbine readers may remember writer Doug Rozendaal, who through his prolific flying career, contributed a number of articles to this magazine. As Chief of Staff of the Commemorative Air Force and a longtime warbird pilot and enthusiast, he is a regular on the air show circuit, flying any number of warbirds. Earlier this year, he began flying the Boeing B-29 Superfortress, so we brought him back to find out what it is like to fly one of the biggest warbirds in the fleet.

PHOTO CREDIT: ADAM GLOWASKI

My first job in aviation was over 30 years ago flying right seat in a DC-3 hauling overnight express packages. The co-pilot's primary responsibility was humping 7,000 pounds of overnight letters and packages up the 12-degree incline created when the airplane was sitting on its tailwheel. That ignited a passion for old airplanes and that led me to warbirds. There, I came to appreciate the stories these airplanes can tell and the excitement they can create for young people, of all ages. (Yes, airplanes can make people feel young again.)

I have been richly blessed to fly many of the significant airplanes of WWII. Museums and private collectors need someone to fly an airplane and that provides an opportunity to fly a new type. For the last several years the leader of the Commemorative Air Force B-29/B-24 Squadron had been pushing me to come to their spring ground school and

PHOTO CREDIT: ADAM GLOWASKI

start the process of checking out in the CAF B-29, *"FIFI."* This spring I agreed, and so I went to Texas for the annual spring ground school.

WWII aircraft are remarkably simple and share very common systems. The U.S. military recognized the benefits of standardization and many of the components are interchangeable between various models and even manufacturers. The voltage regulators are almost universal from a trainer built by North American to a bomber built by Boeing.

If the appliances are the same then the systems will almost certainly be similar. So often learning a new aircraft type is about learning the differences. The B-29 is a Boeing product and Boeing airplanes are almost entirely electric. Since I had not flown the B-17, I had some extra learning to accomplish. But with some home study prior to arrival, it all made sense, and I passed the written test at the end.

The next thing was to get scheduled for initial flight training. Back to the books again. One of the squadron members is a gifted technical writer and he has crafted expanded checklist procedures and flight profiles that make the transition easier. There are six pages of a challenge-and-response checklist that must be accomplished before the airplane leaves the ground, and five more before it is landed and parked. The co-pilot's main responsibility is to manage that checklist. That, plus learning the flight manual and the limitations. There is quite a bit of head work to do before arriving at the airplane to fly.

"FIFI" is a big airplane. With a 141-foot wingspan and 110,000-pound gross weight, it is three times bigger than anything I had flown previously. Patience is not only a virtue in big piston airplanes, it is mandatory. From the time the crew assembles at the nose for a briefing until the airplane leaves the ground is at minimum 30 minutes. The flight engineer has already been at the airplane for a couple of hours fueling, oiling and pre-flighting the airplane. Each engine has up to 90 gallons of oil, and it might require 15 minutes of idle time on a cool morning to reach 40-degree Celsius oil temp before brake release.

Crew is a key word in flying the B-29. The normal crew in wartime was 11 and *"FIFI"* flies with 6. A pilot, co-pilot and flight engineer up front, plus left and right scanners, and a rear scanner/APU operator in the tailcone. These crew members have key roles in normal flight, and critical roles in emergencies. Getting the airplane in the air is a ceremony and requires clear and concise communication from everyone.

None of the WWII bombers had nose wheel steering and all of them have marginal brakes. Learning to taxi them is often harder than flying them. Fortunately, my B-25 experience was a huge help in taxiing the airplane. The brake chambers on these airplanes are large and the brake valves are basically pressure regulators. There is no feedback in the pedal other than a spring and a mild application of brake results in the fluid filling the brake chamber very slowly. Holding the appropriate pedal pressure, and waiting until the chamber fills will yield a nice brake application, but pushing the pedal until you feel, or hear, the brake engage, will result in a brake pressure far in excess of what's desired. The brake barks, the tire squeals, the airplane lurches, in one direction and the pilot releases the brake quickly, only to have to restart the procedure on the other side to stop the excursion.

The CAF Airpower History Tour takes *"FIFI"* to airports unaccustomed to aircraft having a wingspan 23 feet longer than a 737. This often requires shutting down the No. 1 and 4 engines and "X-ing" the propellers to clear taxiway lights and signs. The outboard propellers clear the ground by a measly 28 inches, and the inboards only 14 inches. Obstructions and FOD are a major concern while taxiing.

The flight engineer (FE) is the hardest-working person on the airplane. The FE operates everything but the flight controls, gear and the flaps, including providing the hydraulic pressure to the brakes. The pilots have throttles, but other than for taxi and initial takeoff roll we never touch them. Power settings are called to the FE as needed. To eliminate confusion, power settings are called as individual numbers. So, lined up on the runway before brake release the pilot flying might call, "Engineer's throttles, set manifold three-zero." Flap settings are called as "Flaps 15."

Lined up on the runway with the engines spooled up to 30 inches of manifold pressure, the pilot flying takes the throttles and releases the brakes. The 16-foot, 7-inch propellers provide a

The real work is done by the flight engineer who controls nearly every aspect of the airplane, including the throttles. The pilot controls the throttles during taxi and the initial part of the takeoff roll. After that the FE has everything.

very strong left turning tendency. Using the brakes on takeoff roll is verboten, so the hot tip is to have the rudder fully deflected and lead with some power on the left side as the brakes are released. Early in the takeoff roll before the rudder is fully effective, full rudder deflection left and right may be required. The first decision speed is 80 miles per hour. Any problem prior to 80 is an abort. The next decision speed is 125. Directional control cannot be maintained with an engine out below this speed.

The airplane accelerates quickly, the gear comes up and the airplane climbs away nicely. This was not always the case. The B-29 was fitted with the first version of the Curtis-Wright R-3350-57. It was an engine before its time, and it suffered from numerous problems. Engine failures, engine fires and serious overheating problems were all just a way of life in the B-29. Large power reductions immediately after takeoff were mandatory and flying her was a struggle between cooling and climbing. Many lives were lost when B-29s ditched in the Pacific Ocean after engine problems.

The CAF flew "*FIFI*" until 2005 with the original engines and they were so unreliable the decision was made to ground the airplane. She sat sadly in our hangar in Midland, Texas for five years. It seemed she might never fly again, but that's not how the CAF works. The entrepreneurial spirit of our members rose to the occasion and it was decided that maybe she could be refit with better engines. The problem was that the engine mounts were specific to the -57 engines and the nose case gear reduction needed to turn the huge propellers was a ridiculously low 0.35 to 1 reduction.

The solution was to build engines using the nose and accessory case from the -57 engine and the power section from a much more advanced 3350 used in the Douglas AD-1 Skyraider. The combination was tested on a test stand and it worked. This power section was significantly different and it required extensive modifications to the cowlings and an entirely new exhaust system, and it had to be done for all four engines. It was a massive undertaking made possible by a major donation from Jim Cavanaugh of the Cavanaugh Flight Museum in Addison, Texas. The new hybrid engines have performed very well and normal climb power settings can be maintained.

Once the airplane is up and flying at a cruise power, she indicates 190-200 mph. Add a 2 percent increase for every 1,000 feet of altitude, 200 KTAS is a good flight plan speed at 6,500 ft. This while gobbling up 500 gallons in the first hour and 400 per hour subsequent. But topped off with 5,460 gallons of avgas, she could go a very long way.

The flight controls are fly by wire, wire cables. There is no hydraulic boost on anything. The best way to fly is with one hand on the yoke and the other on the trim wheel. Push or pull to achieve the desired pitch and relieve that pressure by following with trim. The ailerons are fairly light by comparison, but the response is slow. She is very stable in pitch and roll and relatively stable in yaw at cruise speeds. Frankly delightful to fly in smooth air.

Large radial engines do not like abrupt power changes so the secret to an arrival is planning ahead. Initial flap speed in 220, but in order for the scanners to inspect the landing gear, it is lowered at 180 mph before initial flap extension. "Manifold 26" in level flight will get the airplane below that speed easily and the fun begins.

Every pane of glass in the nose seems to have a different index of refraction. Items appear to move around when viewed through different windows.

As the airplane slows, the flight controls become considerably less responsive. And the airplane becomes less stable, especially in yaw. Downwind at 170, base and 160, and decelerating to stable approach at 125. Stall speed in the landing configuration is 95 and the airplane is now a bit of a handful. The secret, as in any airplane is small corrections made early. Aileron inputs will result in adverse yaw that, uncorrected, will drag the nose several feet in the opposite direction of aileron application. Manifold 22 or 24 seems to be the power setting for the final. Getting slow in the landing

configuration is a bad idea. It takes a big power increase to get the speed back.

The sight picture is unlike anything else. The entire nose of the airplane is covered in small windows with hefty frames to accommodate cabin pressurization. Every window seems to have a different index of refraction causing landmarks outside to appear in different places depending on which pane of glass they are observed through. Not having a nose in the traditional sense on the airplane also is a new experience. But if the airplane is stable on glideslope and on speed at about 50 feet, the call is "Ease 'em off."

This is the FE's que to begin a gradual power reduction and the pilot flares in concert with the power reduction. If all goes according to plan, the airplane can be rolled on the runway in a most pleasing fashion, the nose is lowered and the residual thrust from the gigantic propellers continue to pull the airplane down the runway until the brakes are applied, CAREFULLY. Nothing to it. Right?

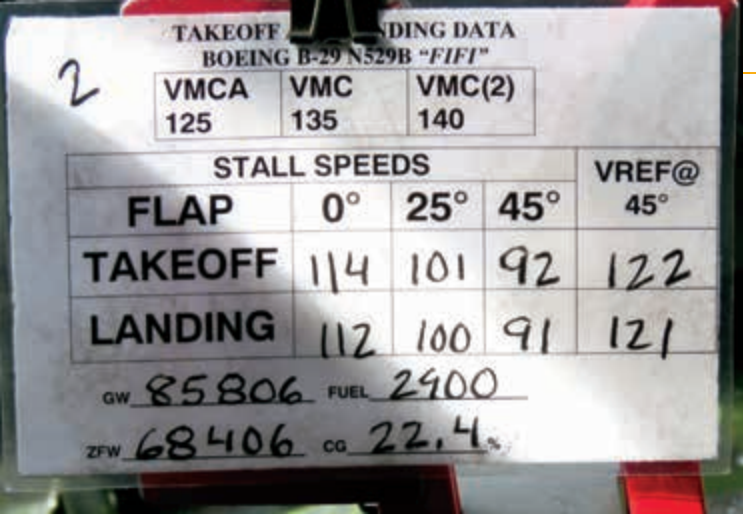
There are some other idiosyncrasies. On the rear of the fuselage below the horizontal stabilizer there is an electrically controlled tail skid that raises and lowers with the gear. One of the responsibilities of the Aft scanner/APU operator is to ensure that it extends. A line drawn from the main wheel to the tailskid is 5 degrees above level. This means that if the nose rises more the 5 degrees on landing, the tail will strike the skid.

Airplanes are intended to be flown and not driven. This means that for the most part, they should leave and return to the earth at the slowest possible speed. If the pilot happens to make the "ease 'em off" call slightly early, or late and the airplane starts to settle, or bounces, any aviator knows that pulling back will soften the impending arrival. Wrong! The CAF paints the tailskid bright red and it bears the signature of the most recent remover of the paint. (At this writing that would be the author whose signature is augmented with two hash marks.)

A 5-degree landing pitch window from nosewheel first to tail strike is pretty narrow. With both hands on the yoke and the engineer on the throttles, calling for some power and getting the engines spun up before the arrival just isn't going to happen. The solution is to swallow your pride, and ride out the firm arrival. The airplane takes it in stride, but it is not very rewarding to the pilot flying.

The reward in flying warbirds is not a "roll-on landing." Flying these historic airplanes is about using them as a hook to bring young Americans to the airport. Our hope is they might come to know and understand the price that was paid for their freedom. The old CAF cliché "Lest We Forget" is more

With no hydaulic boost on anything, the best way to fly is with one hand on the yoke and the other on the trim wheel.



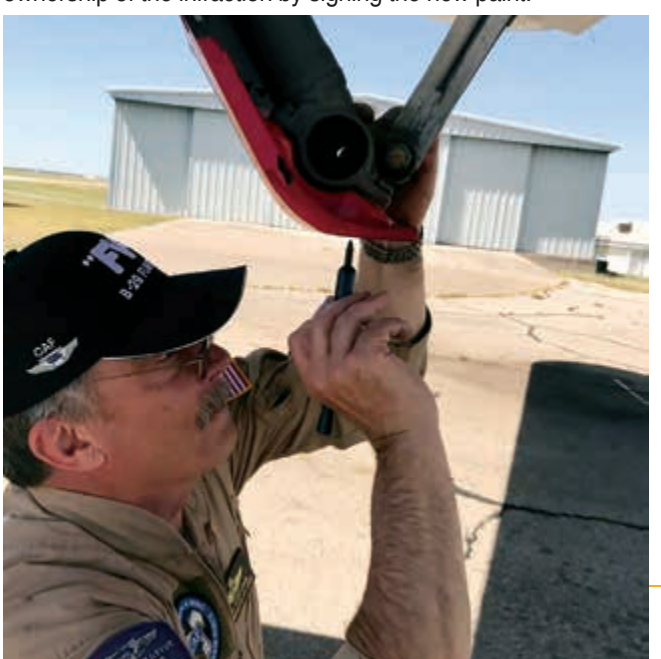
FiFi's TOLD card for a lightly loaded short flight at 86,000 pounds, nearly 25,000 pounds below gross weight. She was loaded at just over half tanks, with 2,900 gallons of 100LL on board.

important today than ever. It's so a granddad or grandmother will bring the current generation to the airport to see and touch an old airplane. Share stories about a time when we were losing the war in the Pacific. About a brother on a ship in the Pacific who never came home. Or a neighbor who walked on to the beach at Normandy and survived but brought home the scars left by walking among the bodies on the blood-stained sand of Omaha Beach.

Preserving and flying these airplanes to preserve those stories, good landing or bad landing, is rewarding work. And occasionally, a "roll-on landing" is nice too, especially nice because you know you earned it. T&T

On any given day, you might find Doug Rozendaal flying aerobatics in a P-51 at an air show, flying a twin or turbine doing pilot service or charter, or flying his B-55 Baron or F-1 Rocket working in his lubricant, packaging and real estate businesses. He holds an ATP, CFII, MEI, SES, and several type ratings in World War II aircraft. Email Doug at dougr@petroblend.com.

The pitch window for landing is very narrow. In accordance with CAF custom, after scraping the tail-skid, the author takes ownership of the infraction by signing the new paint.



Deferred Maintenance

"Pay me now, or pay me later." (Fram oil filter slogan, Circa 1971)

DMI (Deferred Maintenance Item) – postponing maintenance activities in order to save costs, maintain a schedule or to meet budget constraints. The failure to perform such repairs could lead to higher long-term costs, component deterioration and ultimately, component failure.

Lately, the Duke has been enjoying some fixes and upgrades: new boots, overhauls on the mags and props, avionics upgrades including a nav/comm, WAAS GPS and an ADS-B. But the air conditioning compressor blew a gasket (literally), the 48-year-old KWX-50 black-and-white weather radar only receives *The Dick Van Dyke Show* and the engines are nearing TBO. With just 300 hours to go, I'm staring at $160,000 for two overhauled TIO-541's and $25,000 for a new color radar. Everything is relative and we have readers who regularly spend much more than this; I get that. But to carry four people and luggage, at 20,000 feet and 220 kts, on an airline pilot's salary, the Duke suits me.

Long past its useful life, Kevin Dingman's 48-year-old KWX-50 black-and-white weather radar is only good for watching *The Dick Van Dyke Show*.

A Budget Far, Far Away

Many readers have written describing their experiences and difficulties maintaining, upgrading and even sustaining, their airplanes. When our receivables under-fly the payables, difficult decisions must be made. We often purchase a little bit more airplane than we can afford, forgetting that component issues, new technologies, regulations, insurance, training and other owner-pilot needs and whims will prompt unforeseen spending. I'm not immune to this forgetfulness and whimsical spending because the Duke and I are sometimes far apart on a budget. As described above, my $250,000 airplane currently "needs" yet another $185,000 worth of stuff in addition to the regular items that break. But asking your shop to defer maintenance items to massage the budget can put your AMT (Aviation Maintenance

Because maintaining an aircraft is an expensive proposition, aircraft owners often ask their aircraft maintenance providers to defer noncritical maintenance items. However, putting off minor issues can sometimes lead to bigger (and perhaps dangerous) problems down the road.

Technician) in an uncomfortable position of not only liability, but morality. The maintenance shop I use has encountered many owners experiencing this conundrum and asked me to write an article emphasizing the importance and long-term value in keeping up with both large and small maintenance needs. Maybe they were trying to tell me something.

You Can't Make Me

While some shops may require that service bulletins (SB's) are met and recommended overhaul times for components are not exceeded, only AD's (Airworthiness Directives) and mandatory inspections, whether accomplished every 100 hours, on a progressive schedule, or as an annual inspection, are required by the FAR's. Company flight departments or insurance companies may impose additional compliance conditions.

However, even if found during a mandatory inspection, the FAA allows us to defer some of the non-airworthy items our shop may uncover. Title 14 CFR section 91.205 lists the aircraft equipment and instruments that must be installed and requires the instruments and equipment to be in an operable condition. For example, if you don't have an MEL and CDL (Minimum Equipment List and Configuration Deviation List, discussed shortly), you may only fly with certain instruments inoperative, provided that:

- The inoperative instruments are not basic VFR-day instruments that were required to get the aircraft certified in the first place;
- The inoperative instruments are not listed in the aircraft's equipment list, such as stall warning horns or other items listed in the type certificate or items required for the type of flying you're about to do (such as lighting for night flying);
- The required instruments are not required by an AD;
- The inoperative instruments are deactivated, clearly marked as inop and are recorded in the maintenance records.

Give Me A Break

Outside of the above conditions, section 91.213 addresses inoperative equipment and provides relief from section 91.205 through the use of an FAA approved MEL. The MEL allows flight with components either inoperative or degraded. It's aircraft-specific and spells out which equipment may be inoperative along with procedures required to operate under very specific conditions while maintaining airworthiness. If a component is not listed in the MEL, the item should be considered as required: the wings, landing gear and motors are obvious examples. The MEL will list actions and procedures that must be accomplished by the Operator "(O)," Maintenance "(M)" and Dispatch "(D)" to use the relief provided by the MEL.

Another avenue in which we may continue to fly with missing pieces-parts is the CDL (Configuration Deviation List). Examples of CDL items are missing vortex generators, static discharge wicks or fairings and panels. For large aircraft, a separate NEF list (Nonessential Equipment Furnishings) may include things like window shades or galley equipment. However, when multiple operators discover an operational issue or defect with a critical

component, a notice may come to you in the mail.

A Letter from the IRS

Receiving a SB (Service Bulletin) or AD (Airworthiness Directive) in the mail is right up there with a letter from the IRS. An SB is a notice from a manufacturer informing operators of a product improvement or problem. Having realized that there are distinct levels of seriousness, manufacturers may categorize them as informational, optional, recommended, alert or mandatory. It may be something minor like replacing the original metal chains on the fuel caps with plastic retaining lanyards, or something severe like a crankshaft inspection. The first thing to do is read the section that describes to whom the AD or SB applies. Affected users are normally identified by the component manufacturers name and serial numbers or part numbers for the affected component. Although a service bulletin may be listed as mandatory, compliance isn't necessarily required unless accompanied by an AD. I'll add a caveat here: a recent "mandatory" SB (that is not yet an AD) for a piston-engine component or described failure to comply with the SB as possibly resulting in "a sudden and catastrophic failure of the engine." Try justifying non-compliance with that one when someone prosecutes you for crashing into their pre-school. An Airworthiness Directive (AD) is issued when the FAA believes that a perilous condition exists in a product (engine, airframe, appliance or propeller) and the potentially unsafe condition needs special inspection, alteration or repair. An AD will often reference a service bulletin as a method of complying with the AD. An example of an AD is the wing attach bolts on many Beechcraft and the pressure decay test on many combustion heaters for the cabin. AD's are legally enforceable regulations, and if you own or operate the listed item, compliance is mandatory.

Don't put off until tomorrow, what you can do today.

– Benjamin Franklin (and your AMT)

We can agree that the following are critical components for keeping the airplane in the air: The wings, empennage, fuselage and flight controls. If any of these are missing or severely damaged, we will have an aircraft control, weight and balance or life support issue. Those components are followed very closely by the propulsion system that may include propellers or turbine components and a fuel storage and delivery system. We won't necessarily die without a propulsion system, but an off-airport landing in a twin-and-turbine style airplane would be interesting. A landing gear system is next on our list of priorities so that we may land on a nice surface of our choosing. Again, this system isn't needed for survival, but it should increase our odds during the landing. With the above axioms in mind, consider the following list of squawks that owners (myself included) most often ask AMT's to defer, and my experience with some of them:

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SINGLE-ENGINE APPROACH AND LANDING.

Robie Elliott
Cessna 421C Professional Pilot
SIMCOM Customer

I was ready.

"Too many routine in-flight engine shutdowns in twin-engine airplanes end in disaster."

"Vmc loss of control on approach after an engine failure in a multi-engine airplane - I read about it all too often in the accident reports. The simulator time I spend at SIMCOM experiencing engine failures, single-engine approaches and landings is simply invaluable. When it really happened to me, I was confident and proficient. The outcome was never in doubt. Thanks, SIMCOM."

Watch the video of Robie Elliott describing his in-flight experience at simulator.com.

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Fuel Leaks

I once had a slow drip from a wing-tank. The fuel bladder quick-drain eventually gave way and the entire right system leaked out. Only the crossfeed kept the motor running.

Metal in an Oil Filter

We found three bad lifters and cam lobes on the right motor. Repairs were made.

Brake Discs and Pads

A fellow Duke owner's brakes failed and he went off the end of the runway.

Flight Controls with Corrosion

Haven't seen this one yet, but I did have an autopilot trim issue because the tension on the elevator cable was wrong.

Worn Fluid Hoses

A very small engine-oil leak eventually (two years) exposed itself when the fitting became loose enough to cause a large drop in oil pressure. I shut it down and landed single engine to LPV minimums.

What started as a deferred maintenance issue – a small oil leak – on Kevin Dingman's Beechcraft Duke led to a drop in oil pressure. This required an inflight engine shutdown and landing to LPV minimums in rain.

Overhaul of Old or High-Time Props

My left prop once went into feather on landing roll.

Overhaul of Prop Governors

No experience with this one yet but we don't want the prop to run away on us.

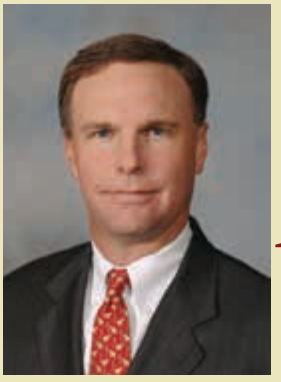
Low Compression on Cylinders (can't we go another year?)

Guilty as charged. I pushed my last set of motors 300 hours past TBO by replacing cylinders as necessary. But this technique could allow a catastrophic failure of one cylinder to trash the rest of the motor.

It's Not Whimsical Spending

Like me, you may have asked your shop to defer some items. Let's do our AMT's and ourselves a favor by limiting DMI's and by keeping up with AD's, SB's and recommended TBO's. Don't blow a gasket over the expense or downtime. It's not whimsical spending; we can pay now, or pay more later. Besides, no one wants an anxious AMT, an unresolved AD/SB or to watch "*I Dream Of Jeannie*" on a black-and-white display. T&T

Kevin Dingman has been flying for more than 40 years. He's an ATP typed in the B737 and DC9 with 23,000 hours in his logbook. A retired Air Force major, he flew the F-16 and later performed as an USAF Civil Air Patrol Liaison Officer. He flies volunteer missions for the Christian organization Wings of Mercy, is employed by a major airline, and owns and operates a Beechcraft Duke. Contact Kevin at dinger10d@gmail.com.



The Fight Against ATC Privatization Continues

by Ed Bolen NBAA President and CEO

As Twin & Turbine readers are certainly aware, NBAA and its members have been hard at work this year as part of an historic coalition of voices opposing privatization of air traffic control (ATC) services in the United States. The recent passage of a funding extension for the FAA did not end this fight; to the contrary, we can expect backers of this controversial plan – backed by powerful airline interests – to continue pushing their agenda in Congress, and it is imperative that our shared aviation community remain steadfast in our opposition to them.

Privatization raises a host of troubling questions, most notably the very real possibility that once the ATC system is governed by what will essentially be an airline cartel, the private entity could assume authority for taxation, investment and access to the nation's airports and airspace.

This scheme also raises concerns from a financial standpoint. Contrary to proponents' claims that a privatized ATC will save costs and improve efficiency, a recent study by the nonpartisan Congressional Budget Office estimates that privatizing ATC in the U.S. could increase the nation's budget deficit by nearly $100 billion.

Despite these and other red flags, proponents for ATC privatization are pulling out all the stops to rally support for their cause. As part of their efforts, they and their third-party surrogates are carrying a pro-privatization message that vilifies business aviation in print, broadcast and online placements.

Fortunately, these efforts have been met by a large, diverse and growing coalition of more than 150 aviation organizations, over 100 business leaders who are also pilots, more than 100 U.S. mayors, consumer and agricultural groups, congressional leaders from both political parties, and a majority of American citizens – all with concerns or outright opposition to ATC privatization.

They have been joined by industry legends, with career-spanning expertise about the nation's aviation system, have raised concerns. In a recently produced TV ad, Miracle on the Hudson pilot Capt. Chesley B. "Sully" Sullenberger asks: "Why in the world would we give the keys to the kingdom to the largest airlines? Because they definitely have their own agenda – to lower their costs."

Apollo 13 Commander Jim Lovell said ATC privatization "would put the traveling public at unnecessary risk," adding "it could even endanger our national security," and concluding that ATC privatization "is a solution in search of a problem."

Most recently, Lovell and Sully were joined by six legendary military heroes, former team commanders with the U.S. Air Force Thunderbirds and the U.S. Navy Blue Angels aerial demonstration teams, in also expressing their fierce opposition to ATC privatization.

With the last-minute passage of an FAA funding extension, privatization supporters will now look to other opportunities later this year to get the bill to the House floor for a vote. Although we have a large, diverse and growing chorus of opposition to ATC privatization, we will need to continue to make our voices heard, and we have the tools to do so.

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NBAA's Contact Congress resource provides a means for using email and social media to alert lawmakers to the industry's opposition to privatization. In addition, a toll-free action line – 1-833-GA-VOICE (1-833-428-6423) – connects constituents with elected representatives, along with a brief list of suggested talking points.

The general aviation community is also supporting a dedicated website – *www.ATCNotforSale.com* – where citizens can learn more about the threat from ATC privatization, and contact their elected officials. A Facebook page – Air Traffic Control – ATC Not for Sale – provides regular updates about the concerns over ATC privatization.

We are at a critical point, one that could determine the very future of our industry. We have fought hard, but we know we must do more. Now is the time for our industry's resounding voice to be heard.

Business Aviation Responds to Calls for Hurricane Relief

Over the past two months, the business aviation community has mobilized in response to devastating storms impacting Florida, Texas, and Puerto Rico. They were aided by a resource established by NBAA to connect relief organizations to operators and personnel able to help at a moment's notice.

NBAA's Humanitarian Emergency Response Operator (HERO) database is a list of people in the business aviation community who are part of disaster-response mobilization efforts. In the aftermath of major crises, basic information from the database is made available to organizations coordinating relief efforts.

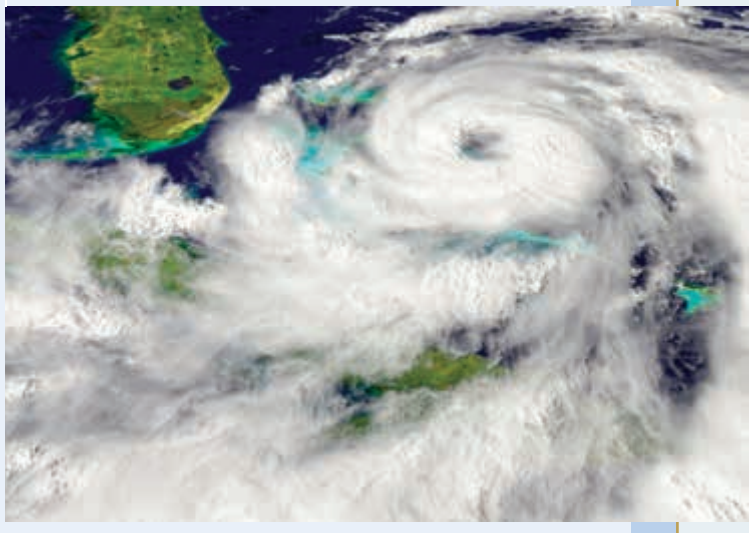
In the days prior to Hurricane Harvey making landfall along the Texas Gulf Coast, dozens of business aviation pilots had already volunteered to transport specialists and supplies into disaster-stricken areas. Two Texas aircraft brokers – Janine Iannarelli, president of Par Avion Ltd. and Robin Eissler, COO of jetAVIVA - worked together to get needed supplies to victims in the Corpus Christi and Houston regions.

To assist with these and other relief efforts, Conroe-North Houston Regional Airport (CXO) made a hangar available as a distribution center for general aviation aircraft to drop off supplies for delivery to storm victims, while Dassault Aviation called upon one of its Falcon 900 large-cabin business jets to transport badly-needed supplies for a Texas community ravaged by the storm.

"We must be dedicated to helping each other wherever we can, because we have the perfect tool available to do so," said Andrew Ponzoni, the company's senior communications manager. "Business aviation allows us to get what is needed most, to exactly where it's needed most."

Even as Harvey subsided, there was no time to rest as the next powerful storm, Hurricane Irma, moved through the Caribbean and Florida. Efforts initially stood up in response to the earlier storm quickly transitioned to assisting victims in those areas, including Operation Airdrop, a volunteer group of GA pilots organized through social media to coordinate relief flights.

At this writing, these and other relief organizations within the aviation community are mobilizing to assist with recovery efforts following the devastation wrought by Hurricane Maria in Puerto Rico. In such times of crisis, business aviation has always rallied to help those in need, contributing to relief efforts in profound and meaningful ways.



BAI - Promoting Ethics and Integrity in Business Aviation

Are professional ethics and integrity cornerstones of your organization? How can you encourage ethical behavior throughout your aviation department, charter operation, maintenance facility or other aviation-related business?

Simply put, ethics are standards that govern the conduct of members of a society or group, while integrity is adherence to those standards. Those are broad, abstract concepts, sometimes difficult to specifically define and apply to real-life challenges.

Whether dealing with a human resources issue, choosing a maintenance vendor, negotiating the purchase of an aircraft or even just determining appropriate travel expenses, it is important to establish and follow guidelines to help employees act with integrity.

Set expectations for your organization's employees, consultants and vendors regarding ethics. These policies should include a general code of conduct, as well as policies for travel, conflict of interest, confidentiality and social media practices.

Conflict of interest – or even the appearance of conflict – can be particularly challenging to define. Managers and leaders must explain that "income" does not just mean cash; it may also be in the form of gifts or other considerations.

Likewise, "employment" – typically meaning receiving a W-2 from an organization – is not the only way to "work for" an entity, while several common industry practices – from pilots disclosing alternate sources of income, to aircraft brokers working on behalf of both buyers and sellers – may represent potential conflicts of interest, even if there is no ill intention.

Once you have established standards or norms for your organization, be sure to review and update them often to help your employees act with integrity. "Integrity goes hand-in-hand with ethics," said Tim Peace, CAM, aviation department manager for PB Air, LLC, and a member of NBAA's Business Aviation Management Committee. "Ethics evolve over time, and technology can blur lines of integrity," partly because identities and relationships can be veiled or unclear.

Employees of large flight departments are often required by their parent company to complete ethics training annually, but such training is less common in smaller firms. Once you establish ethics policies, be sure to train your employees on those policies.

"Company ethics training with annual recurrent requirements is so important," said Chris Broyhill, CAM, who is with business aviation consultancy Mente Group and is a member of NBAA's Business Aviation Management Committee. "It reminds employees about conflicts of interest, travel policies, confidentiality, social media, discretion and other ethics-related topics."

Broyhill also advised that conducting ethics training annually, and documenting that training, can help the company enforce ethics policies and better manage personnel matters related to ethics violations. Leaders should consider offering employees professional training and certification programs that teach ethics and promote integrity.

Of course, ethics must be demonstrated from the top down. Setting expectations for ethical behavior, and training employees on those expectations, is critically important. Top management's actions must be beyond reproach and serve as an example to all.

"As leaders, we need to demonstrate and reinforce this every day," said Chris Adams, regional sales manager at FlightSafety International and chairman of NBAA's Business Aviation Management Committee. "Ethical behavior is an overlying governing principle in my organization. We are held to the highest standards and are expected to be trustworthy, reliable and honest. We are respectful of confidentiality and aim for constant self-improvement and self-development. Ethics and integrity aren't just buzzwords – they are an integral part of our culture."

An expanded version of this article originally appeared in the September/October 2017 issue of NBAA's Member Publication, Business Aviation Insider. Download the magazine app for iOS and Android tablets and smartphones.

Graphical Forecast for Aviation Replaces Text-Based Area Forecasts

On Oct. 10, the transition to graphical forecasts for aviation (GFAs) for the continental U.S. is set to be complete as traditional textual area forecasts (FAs) will be discontinued.

The move, in a transition phase since July, will enable National Weather Service Aviation Weather Center forecasters to focus their efforts on maximizing operational benefit to airspace users, resulting in improved weather information to decision-makers, FAA officials explained in a notice highlighting the change.

"The majority of the weather elements contained in the FA are already available through other NWS products," the agency noted. "To maintain continuity of service, the GFA will ensure the availability of equivalent information, in addition to adding graphical displays of the predominant weather, sky cover, and wind speed and direction."

GFAs are web-based displays that provide observations and forecasts of weather phenomena critical for aviation safety. GFAs cover the continental U.S., from the surface up to 42,000 feet mean sea level (MSL). Wind, icing, and turbulence forecasts are available in 3,000-foot increments from the surface up to 18,000 feet MSL, and in 6,000-foot increments from 18,000 feet MSL to 42,000 feet MSL. Turbulence forecasts are also broken into low (below 18,000 feet MSL) and high (above 18,000 feet MSL) graphics.

Maximum icing and maximum wind velocity graphics are also available. Data is time-synchronized and is available in hourly increments for up to 14 hours in the past and 15 hours into the future.

"This is a huge step forward," says John Kosak, NBAA Air Traffic Services project manager for weather. "The graphical forecasts provide much finer resolution than any text-based forecast ever could." Kosak has been representing business aviation as a member of the FAA's Collaborative Decision-Making Weather Evaluation Team.

The GFAs will replace the textual FAs only for the continental U.S. The FA for Alaska, the Gulf of Mexico, Hawaii and the Caribbean will not change.

New Study Reaffirms Industry's Contributions to Successful Companies

Ahead of NBAA's Business Aviation Convention & Exhibition (NBAA-BACE), the largest and most significant event focused on the global impact of business aviation to companies and communities across the nation and around the world, the Association welcomed a new study of S&P 500 companies demonstrating that by a host of measures, the use of business aviation is the sign of a well-managed enterprise among America's most highly valued and well-respected companies.

"This report reaffirms what study after study, from one decade to the next, have repeatedly found: smart entrepreneurs and companies understand the value of business aviation in making them more efficient, productive, nimble and competitive," said NBAA President and CEO Ed Bolen. "As this report makes clear, these are America's most innovative companies, most admired companies, best brands, best corporate citizens, and best places to work."

The study, "Business Aviation and Top Performing Companies, 2017," is the sixth completed by NEXA Advisors, LLC and focuses on the ways S&P 500 companies utilize business aircraft to create enterprise value. Analysts examined the financial performance of the S&P 500 between 2012 and 2017, and found that, over that period, S&P 500 companies utilizing business aviation to support their missions outperformed those not using business aviation, as demonstrated by several key metrics, including drivers of shareholder value.

The latest NEXA study highlights three additional financial drivers positively impacted by using business aviation: Revenue or market share growth, profit growth and asset efficiency. Non-financial indicators positively influenced by using business aviation include customer and employee satisfaction.

The study also indicates that companies that closed their flight departments experienced less financial success, compared to those that continued to utilize business aviation, even during economic downturns.

The study also shows that, using a "best of the best" analysis, leading of the S&P 500 overwhelmingly use business aircraft. These include 98 percent of the top 50 among the "World's Most Admired Companies," a list of the global top companies by reputation, compiled by Fortune magazine, as well as 100 percent of the 100 companies in Forbes magazine's listing of "100 Most-Trustworthy Companies in America."

This comprehensive report, commissioned for the No Plane No Gain advocacy initiative, which is cosponsored by NBAA and the General Aviation Manufacturers Association (GAMA), may be downloaded at *www.nbaa.org/business-aviation/nexa-business-aviation-and-top-performing-companies-2017.pdf.*

Honeywell's New iPad App Optimizes Routes

Honeywell has released its latest flight planning application GoDirect Flight Bag Pro. Pilots can create and file flight plans for easy reference, calculate and compare aircraft cruise modes to increase performance, and access real-time weather updates to ensure the aircraft arrives at the destination on time. GoDirect Flight Bag Pro is available via an iPad app, and versions for other tablets are in development.

GoDirect Flight Bag Pro's simple, intuitive interface works on both domestic and international flights. For access to the app, pilots only need an annual subscription to GoDirect Flight Services and an active Honeywell account.

Features of GoDirect Flight Bag Pro:

Flight Plan Overview: To view an upcoming flight route, pilots can type in or paste a route from a website, email or text message into the app. Pilots can also view frequently cleared and optimized routes for best aircraft performance. With in-flight connectivity, pilots can even make adjustments while in the air.

Flight Bag Pro Performance Calculator: Calculate multiple cruise modes and determine the most efficient flight by comparing speed, flight level, time, fuel, cost of the trip and more.

Trip Kit: Package all of the trip documents into a Trip Kit to view during flight. Access the latest weather information for your destination such as icing, winds and temperature, even prior to takeoff.

Flight Schedule Updates: Pilots can receive real-time updates to flight schedules when information is released from air traffic control with a pre-departure clearance, when filing status changes, or when weather conditions change.

To learn more about Honeywell's GoDirect Flight Services, visit Honeywell's website aerospace.honeywell.com. T&T

Raisbeck Certifies Five-Blade Prop for King Air 350

Raisbeck Engineering has received Supplemental Type Certificate (STC) approval from the FAA for its new Composite five-blade swept propeller for the Beechcraft King Air 350.

The composite propeller, designed to improve King Air comfort, performance and efficiency, was developed in collaboration with Hartzell Propeller. At 106 inches in diameter, Raisbeck's propeller reduces weight and contributes to improved short field and climb performance, while providing strength and durability expected from modern composites. The new composite propellers have an extended 3,000-hour, three-year warranty and unlimited blade life.

"This is a significant milestone in our journey to market entry for a composite five-blade swept propeller," said company CEO and Chief Financial Officer Tony Armstrong. "We couldn't be happier and our new propeller will further enhance the King Air 350 performance. We believe King Air operators will truly enjoy flying with these new propellers"

The propeller, which are available for immediate delivery, provides a total weight savings of 47 pounds compared to the current OEM propeller for the King Air 350. T&T

Certification Imminent for Pilatus PC-24

Pilatus expects to obtain certification for its PC-24 light jet from the European Aviation Safety Agency (EASA) and the FAA in December 2017. First customer aircraft is scheduled by yearend.

The Pilatus PC-24 development project has now entered its final certification phase, with the three PC-24 prototypes having flown 1,250 flights and 2,000 hours thus far. Function reliability tests are currently underway with P03, which is a production conforming aircraft.

In preparation for the PC-24's entry into service, Pilatus has launched a 24/7 customer service facility to provide technical support and spare parts. The company has also worked with FlightSafety International to develop a full-motion simulator and maintenance training prior to certification.

Oscar J. Schwenk, chairman of Pilatus, commented, "I'm very pleased with the progress of the development program and am looking forward to the moment when we are awarded the type certificate and can hand over the PC-24 to our first customer. I have no doubt whatsoever that the future operators will be more than delighted with the outstanding performance of the super versatile jet and the countless possibilities it offers."

The PC-24 is the first business jet worldwide designed to take off and land on very short or unpaved runways, and to come with a cargo door as standard. It also boasts a spacious cabin whose interior can easily be adapted to personal requirements. The outstanding flexibility of the PC-24 opens the door on an enviable spectrum of possibilities, whether as a business jet, ambulance aircraft or for other special missions. T&T

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ADVERTISING DIRECTOR JOHN SHOEMAKER
2779 Aero Park Drive, Traverse City, MI 49686
Phone: 1-800-773-7798 • Fax: (231) 946-9588
E-mail: **johns@villagepress.com**

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So You Want to Buy an Airplane

Each time I buy an airplane (now on number 10) I get a little more organized. Perhaps you can learn from my successes and failures. Here's some things you should consider.

Who Are You Buying From?

My experience with purchasing from the manufacturer (Textron in my case) on both new and used Citations has been excellent. Although you are unlikely to get a "distressed price" from the OEM, they have some flexibility in offering extended warranty or service agreements that others don't. There are also many reputable brokers who specialize in your specific aircraft and can do market analysis and locate the best deal. Their fees are often negotiable but I find you often "get what you pay for." I have dealt with the best and the worst brokers. The best is better. A quality broker can make the entire process enjoyable while saving you money in the long run.

Learning From Others

Do you have friends who have recently purchased? Ask them for advice. The best info can be found from accessing the owners group for your airplane and search for experience of others. Most groups also have executive directors who can refer you to key players in the industry.

THE PRE-BUY INSPECTION

Hire someone who specializes in the specific model to lead the process. You can find names and recommendations on the various owner group websites. Once you engage their services, listen to them. I once almost purchased a Falcon 10 that was represented as "no damage" only to find out after translating the logs from French to English that it had been run into by a catering truck in Italy!

I have saved tens of thousands of dollars on purchase costs using a qualified pre-buy inspector.

If a major inspection is part of the pre-buy, you may want to schedule avionics upgrades like ADS-B or paint and interior right after closing and before the airplane is "buttoned up."

SETTING UP YOUR HANGAR

If you are moving to a new hangar, will your new airplane fit? Is there available space at the airport? Find out in advance as there may be a waiting list for your favorite FBO. Is power (110 or 220) available? If you will be in a multiple aircraft hangar, who are the tenants? Can you store the various items (power cart, nitrogen bottle, cleaning supplies) near your airplane?

TRAINING

Simulator availability can be challenging for some models. Get on their schedule as soon as you can. Do a full recurrent or initial course very near your closing date. If you are using a mentor (and you should) call them early and book them. I always have one meet me at delivery and off we go for training.

PAPERWORK

I have used an aviation attorney in some deals but not all. But in every case, I engaged someone who had experience in airplane transactions.

PROGRAMS

Often, an airplane enrolled on engine overhaul and parts programs will sell for hundreds of thousands more than one not on programs. Each program has a current "balance." Some accounts may be negative or in arrears. Find out if the dollars in each account will be transferred to you after purchase. Make sure your purchase contract specifies what happens to these monies.

DATABASES

Before closing , contact data providers such as Garmin, Rockwell Collins and Serious XM Weather to set up an account. Make sure you update your flight planning vendor to reflect the avionics status of your new airplane. If you are waiting on RVSM approval post closing, make sure your airplane's limitation is noted in the proper "box."

STOCKING THE AIRPLANE

If you are replacing a prior airplane, take the opportunity to throw away about half the "junk" you had on the old one. This will lighten the weight you have been carrying around for years.

INSURANCE

Call your broker and get coverage approval early. Have them review your hangar lease for coverages. Many insurance carriers offer rebates on insurance premiums to members who participate in annual operators conferences.

THE FAA

If you are changing your N number you will need a new certificate of airworthiness. Failure to do so can be painful. Get your RVSM application (if flying above FL280) prepared in advance. I have seen the approval time reduced from 3 months or more to less than four weeks for my latest Mustang purchase. Proper planning when purchasing a new aircraft should allow you to depart from delivery with RVSM approval.

Enjoy your new ride.

Fly Safe.

With 6,000-plus hours in his logbook, David Miller has been flying for business and pleasure for more than 40 years. Having owned and flown a variety of aircraft types, from turboprops to midsize jets, Patty and David currently own and fly a Citation Mustang. You can contact David at davidmiller1@sbcglobal.net.

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