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NOVEMBER 2016 $3.95 US

VOLUME 20 NUMBER 11

Aerial Yachting In The Royal Gull

2016 Holiday Gift Guide

Trouble-free Turbocharger Operation

Twin & Turbine

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aviationimaging.com

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Issues of
Twin & Turbine
are available for free
www.twinandturbine.com

Contents

NOVEMBER 2016 • VOL. 20, NO. 11

FEATURES

Twin & Turbine (ISSN 1945-6514), USPS 24432 is published monthly by Village Press, Inc. with advertising offices located at 2779 Aero Park Drive, Traverse City, Michigan 49686. Telephone (231) 946-3712. Printed in the United States of America. Periodical Postage Paid at Traverse City, MI.

SUBSCRIPTIONS: *Twin & Turbine* is distributed at no charge to all registered owners of cabin-class aircraft. The mailing list is updated monthly. All others may subscribe by writing to: *Twin & Turbine,* P.O. Box 968, Traverse City, MI 49685, or by calling 1-800-447-7367. Rates for the United States and its possessions follow: one year $29.95; two years $52.50. Canadian subscriptions are $15 per year additional, including GST tax. Overseas subscriptions are $30 per year additional, U.S. funds. Single copies $3.95.

ADVERTISING: Advertising in *Twin & Turbine* does not necessarily imply endorsement. Queries, questions, and requests for media kits should be directed to the Advertising Director, *Twin & Turbine,* P.O. Box 968, Traverse City, Michigan 49685. Telephone 1-800-773-7798. Website: *www.twinandturbine.com*.

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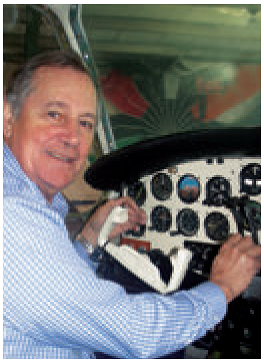
POSTMASTER: Send address changes and inquiries to Twin & Turbine, Village Press, Inc., P.O. Box 968, Traverse City, MI 49685.

editor's briefing

Sharing The Burden, And The Benefits



Owning and managing a cabin-class airplane can be a burdensome proposition, despite the beneficial bounties of being able to go where you want, when you want, in privacy. The care and feeding of our airplane isn't cheap, especially when you add in storage, maintenance and insurance. Private flying is a wonderful freedom and privilege, at whatever level you participate—jet, turboprop, piston twin or single. But, all of us bog down a bit now and then, under the weight we carry just to have the plane in the hangar.

If there's one way to ease the burden, it's to involve yourself in the camaraderie of aviation. You probably aren't the only aircraft owner on the field, or even in the hangar, with similar worries. Walk over to the person with the luggage stacked by his or her bird and introduce yourself, as the owner of that set of wings across the way. Before long, you'll probably find that the two of you have flown into some of the same places, had the same recurring failure mode in the GPS, gotten a curiously complex routing from ATC or are looking for the same ways to make flying easier.

It's just comforting to know you're not alone, out here on the ramp. And maybe you two can share a ride sometime, perhaps to pick up one or the other's stranded airplane, or when you happen to be on the way to a common destination. Yes, we like to do things our way, by ourselves -- but once in a while it's nice to find a fellow spirit.

This extends, of course, to type-club meetings, but that's probably a once-a-year opportunity unless you're into chapter activities. Owning similar airplanes represents a unique bond, so one should take advantage of the fellowship the connection offers as regularly as you can, especially if your Duke or CJ compatriots are close by. It's worthwhile to put your gripes and gratitudes in a basket and pull each other's out for examination.

Some of the best benefits of sharing are gained in actually partnering up on an airplane. It does take a special connection with an individual to want to buy part of a plane with them, but when it works it helps both financially and spiritually. Each partner can uplift the other when a rough patch is encountered.

Probably the best time to consider forming an airplane owning partnership is when your annual utilization is below 100 hours per year, and you don't see much likelihood of it increasing. It will be better for the airplane to get more exercise, and splitting up the costs will make ownership more palatable. Yes, there will be a little more wear-and-tear from increased flying, but the big items, fixed costs like storage and insurance, are knocked down. Friendships aside, partnerships should be set up like any business, on paper and agreed upon.

Going it alone is fine, once in a while. Sharing the burden is better, for the long haul.

LeRoy Cook

The PIAGGIO

A Twin-Engine Amphibian with Italian

By **LeRoy Cook**

Flair

Royal Gull

The available examples of twin-engine general aviation amphibian airplanes make a very short list, and their marketing success has been quite limited, for various reasons. To build a rugged airframe for water use, light enough to be powered by relatively small piston engines, at a cost within reach of primarily recreational users, is a difficult set of tasks. And then there are the hurdles of training and insuring low-experience pilots…

Even so, there's a universal appeal engendered by the freedom and utility of aerial yachting. To be able to land friends and family on both water and runways, visiting remote beaches and urban airports alike, opens up worlds beyond that of normal flying.

Captain John Mohr, who pilots Boeing 767s for Delta Airlines, is uniquely qualified to talk about this distinctive aspect of aviation, and his unique airplane, a Piaggio P.136 Royal Gull. The beautiful Gulls were designed and built in the 1950s (the prototype flew in 1949, using 215-hp Franklin engines similar to the Republic SeaBee's), a creation of the Piaggio company in Genoa, Italy. It was obvious that more horsepower was needed than that offered by the Franklins, so Piaggio turned to the most powerful small engines available at the time, the geared GO-series from Lycoming. Used in Aero Commanders and Twin Bonanzas of the era, the Piaggio's engines were given flanged crankshafts in place of the normal splined shafts, in order to mount reversing propellers.

The Gull is a pusher design, with the wing built in an arched seagull shape to keep the engines high during water operations. This places the cabin well forward of engine and prop noise, and it also allows for easy nose-in beaching, made easier by a swing-open windshield as well as two large side doors. It's an impressively large airplane when sitting on an airport ramp, with a height of over 12 feet and an arched wingspan of 44 feet. Given its conventional (tailwheel) landing gear, the engines are well above head height. On the water, the aircraft takes on a more level attitude, drawing a mere 24 inches of draft at dockside.

A Water Flying And Barnstorming Tradition

Captain Mohr is what you might call a veteran water pilot. His grandfather was an early-day barnstormer, who later operated a flying service at Crane Lake in northern Minnesota. John Mohr learned to fly while sitting on his father's lap in a float-equipped Piper J-3 Cub, starting at about age 5; he unofficially soloed in that Cub at age 14. The airplane was bought new by his grandfather in 1946, and it's still in the family.

John Mohr worked through his growing up years at all manner of aviation jobs, flying Cessna floatplanes in his family's operation, working for a charter operator flying Piper Aztecs and doing a stint in Twin Beech freighters. He also flew airshows for over 25 years in a stock Stearman PT-17, retiring after the 2013 season. He joined North Central Airlines in 1977, first flying the venerable "Blue Goose" Convair 580 turboprops, and he has moved through various acquisitions of the airline to his present seat in the company's 757/767 international operations.

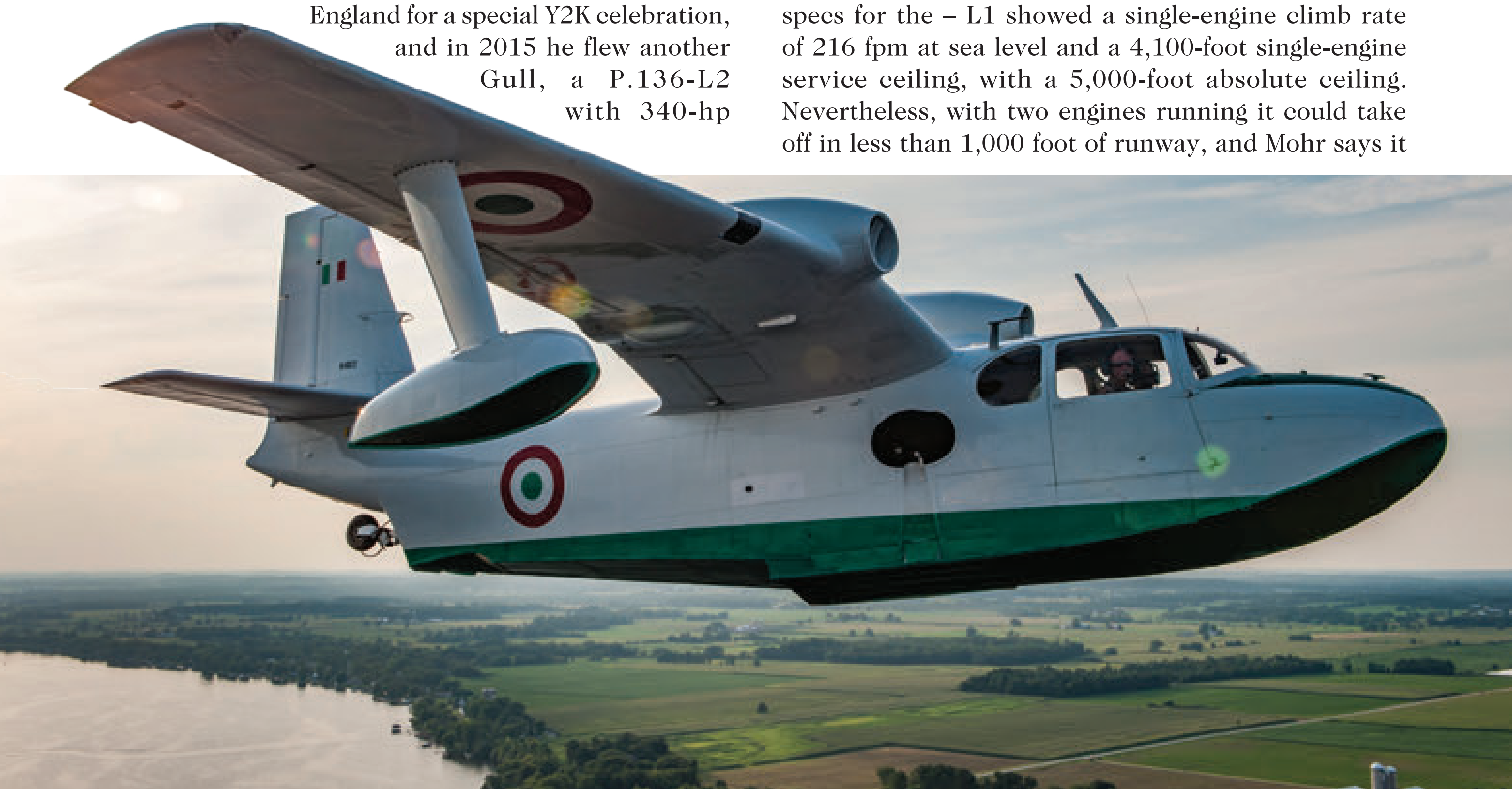
He bought his Royal Gull in 1993 and has flown it for about 1,500 of its 3,500 total hours. Among its significant mods are the change to reversing Hartzell propellers and the installation of 295-hp GO-480-G2D6 engines, as used on the Beech Twin Bonanza D50. Mohr has the ability to install a 70-gallon ferry tank for long flights, giving him 7.5 hours of endurance. In the year 2000, he flew his Gull across the North Atlantic to Southampton, England for a special Y2K celebration, and in 2015 he flew another Gull, a P.136-L2 with 340-hp supercharged GSO-480 engines, over to Italy, visiting the aircraft's birthplace. Normally based in the Twin Cities, he's had his airplane to the Bahamas and other Caribbean destinations, he's gone as far south as El Salvador in Central America, and he based it in Alaska one summer, using it for fishing and exploring during airline layovers.

The American Connection

In all, some 65 P.136 Gulls were built by the Piaggio company, about half of which were assembled and sold in North America by Milwaukee company Kearney & Trecker, an industrial machine tool supplier. President Francis Trecker was on a trip to Italy in the early 1950s and was impressed with the Piaggio airplane's versatility, so he acquired the North American rights for his company. The airframes were shipped by container to Milwaukee and the engines, propellers and avionics were installed by Trecker Aircraft Company, which marketed it as the Trecker Royal Gull. The name "Royal Gull" was actually applied by Kearney & Trecker, which initially formed a subsidiary, Royal Aircraft Corporation, that later became Trecker Aircraft.

The Piaggio P.136 is one of the few foreign airplanes to receive its own FAA (actually CAA Part 10.30) utility-category type certificate, #A-813, originally issued August 15, 1955, rather than being certificated under reciprocal agreement. The P.136-L had 260-hp GO-435-C2B engines, the –L1 was fitted with 270-hp GO-480-B1B engines and the –L2, certificated in normal category on March 7, 1957, carried the 340-hp GSO-A1A6 supercharged engines.

Because of their size and weight, the first Gulls didn't have outstanding single-engine performance. The factory specs for the – L1 showed a single-engine climb rate of 216 fpm at sea level and a 4,100-foot single-engine service ceiling, with a 5,000-foot absolute ceiling. Nevertheless, with two engines running it could take off in less than 1,000 foot of runway, and Mohr says it



uses about the same water distance as ground roll. Lightly loaded, he can match a Super Cub in takeoff performance. The supercharged – L2 version improved SE performance considerably, despite an increase in gross weight to 6,614 pounds on land, 6,393 pounds on water.

The engines turn 3,400 rpm for takeoff, but are immediately reduced to 3,000 rpm for the maximum continuous power rating. Cruising at 2,750 rpm and 21 inches manifold pressure, Mohr achieves 140 knots, burning about 34 gallons per hour. Yes, other similarly-powered airplanes are faster, but they are only good for one water landing.

The Gull's over-the-wing engine cowlings prop open for easy maintenance access (with ladders or from the wingwalks). As with any pusher design, care should be taken during preflight to make sure no loose objects are poised to travel back to the propellers. There are no cowl flaps, no fuel tank management is required, and the gear's hydraulic system is powered by an electric power pack under the three-place rear seat, backed up by a hand pump. The flaps and tailwheel lock are also hydraulically-actuated; the flaps can be extended to any setting up to 45-degrees.

Fuel is contained in a pair of 95-gallon aluminum tanks in the fuselage, each one feeding its respective engine. The maingear swings up into open wheel wells under the wingroots, the tires remaining partially exposed while the struts are covered by fixed doors. Main tire size is 8.50 x 10. The 5.00 x 5 tailwheel also retracts, and it is not steerable, so brakes are needed for ground maneuvering. It does lock into a straight position for takeoff and landing. The water rudder below the tail extends and retracts, activated by a handle on the overhead console, allowing precise water maneuvering without differential power. The fuselage is divided into seven water-tight compartments.

SPECIFICATIONS Piaggio P.166-L1 Royal Gull	
Powerplants	Lycoming GO-480-B1B
Seats	5
Fuel	190 gallons
Performance	
Service ceiling	18,500 ft.
Single-engine ceiling	4,100 ft.
Max. cruise speed	164 mph
Stall speed	68 mph
Takeoff distance (50 ft. obstacle)	1,380 ft.
Landing distance (50 ft. obstacle)	1,410 ft.
Max. range	1,000 s.mi.
Climb rate-2 engines	1,180 fpm
Climb rate-1 engine	216 fpm
Weights	
MTOW	6,000 lb.
Empty	4,400 lb.
Useful load	1,600 lb.
Dimensions	
Wingspan	44.375 ft.
Height	12.583 ft.
Length	35.5 ft.
Cabin length	96 in.
Cabin width	54 in.
Cabin height	48 in.
Baggage	420 lb.

Permission To Come Aboard

The cabin, reached from either side by climbing up to the waist-high door sill, seats five with two individual seats forward and three seated aft on a wide bench. Up to 120 pounds of baggage can go behind the rear seats, and a separate aft baggage compartment in the tail, adjacent to the fuel tanks, can take 300 pounds. In addition, there's a line and anchor locker in the nose, reachable by swinging open the right half of the windshield. A 20,000-BTU Southwind cabin heater is in the aft fuselage. Electrical controls are located overhead, along with the starting controls and rudder trim crank. Unlike most twin amphibs, the power levers are on a center pedestal, rather than hanging down from the overhead. The propeller reversing levers are isolated on the left side of the panel. A controls lock pins the right yoke and rudder pedals when moored. The Lycoming GO engines are fitted with an altitude compensating pressure carburetor, so the mixture knobs are merely used for idle-cutoff.

Clearing propellers for starting requires a bit of a stretch to see far aft, but the start-up is otherwise conventional. Taxiing visibility is nearly unobstructed by the nose in landplane configuration, due to the shallow deck angle. Runup requires 2,600 rpm, a product of the 77:120 gear ratio; there are no abnormal items to be checked. Mohr says 2,000 feet of normal water surface is adequate for takeoff with four aboard. He reports minimal prop erosion during water takeoffs, thanks to the high-mounted engines. Vmc is 90 mph indicated, and the best single-engine climb speed is 95. The propellers turn at a mere 2,180 rpm when the engines are at their full 3,400 takeoff rpm. A 120-mph climb speed is normally used; after takeoff, throttles are left full open and the rpm is pulled back to 3,000 for max continuous power. Once gear and flaps are up, 25 inches m.p. with 2,850 rpm is a normal climb power. Cruise rpm is an economical 2,600, or 2,750 for max cruise on 21 or 22 inches.

Half flaps are commonly used for minimum run takeoffs, and they can be lowered at speeds up to 150 mph during approach. The L1 version of the Gull had a maximum gear extension speed of 126 mph, which was also its limit for additional flap extension, but the L2 allowed the gear to be extended at 161 mph IAS, with full flaps permitted at 129. Stall speeds are reported to be about 75 mph with flaps up, and around 68 mph in dirty configuration. As with any amphibian, knowing gear position for water landing is critical, so there are mechanical gear indicators as well as lights.

Yes, there was a landplane version of the Gull, the Piaggio model P.166, which was first flown in late 1957. It was equipped with a nosewheel, with the maingear moved farther aft, and it had a prominent dorsal fin. The P.166 cabin initially seated six, later enlarged to hold 10 or 12. Instead of the P.136's wing floats, wing tip fuel tanks were added to increase fuel capacity for the 340-hp GSO-480 engines, and eventually Lycoming LTP 101 turboprop engines were fitted. T&T

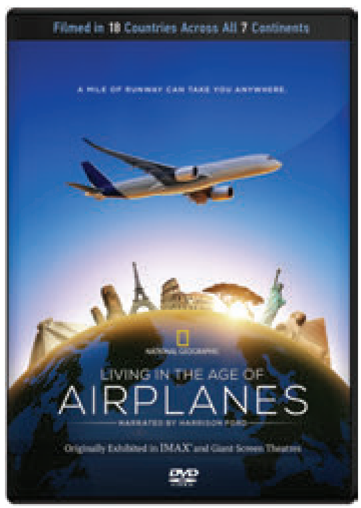
John Mohr is fortunate indeed to have such a versatile airplane at his disposal, giving him access to nearly unlimited landing spots. We only wish there were more of the Royal Gulls around.

2016 *Holiday* Gift Guide

"Living in the Age of Airplanes" Movie On DVD

We who fly often assume, wrongly, that everyone knows how aviation works. And, our own limited perspective may blind us to the overall effect of routine global aviation on everyday living. Starting with our distant ancestors' restriction to a world bounded by few days of walking, Brian Terwilliger's film about how aviation has changed us is a thought-provoking analysis of what we've become, thanks to the airplane.

LIVING IN THE AGE OF AIRPLANES offers a fresh perspective on a modern-day miracle that many of us take for granted: flight. Narrated by Harrison Ford and featuring an original score from Academy Award winning composer James Horner, the film takes viewers to 18 countries across all seven continents to illuminate how airplanes have empowered a century of global connectedness our ancestors could never have imagined.



Following its premiere at the Smithsonian National Air & Space Museum in Washington, DC, the film has continued its successful run on giant screen, digital, IMAX® and museum cinemas worldwide and has now been released digitally and on DVD/Blu-ray, along with the release of the original soundtrack. Running time is about 47 minutes, and there are over 40 minutes of added special features. Through the holidays, the DVD edition is priced at $24.95, with the Blu-ray version priced at $29.95.

To order, go to *www.airplanesmovie.com*


Go Ahead. Stand on the Brakes.

SCOTTeVEST Flight Vest

Making one's in-flight nest often comes up short on handy stowage, as you try to stash glasses, waterbottle, phone and other paraphernalia. What if you just wore the items on your person, in the pockets of a vest that accompanied you to the aircraft? Here's a great gift idea for a pilot friend.

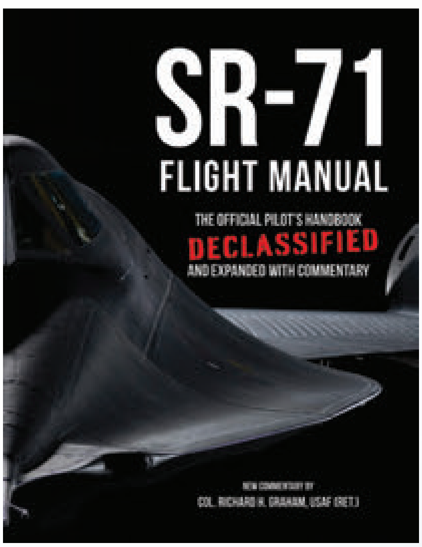
SCOTTeVEST offers its Q.U.E.S.T. Vest, in men or women's styles. It packs an astonishing 42 pockets, including a zippered compartment in the collar to stow the hood and a giant back pocket to stash larger items. The 65% cotton/35% nylon fabric is Teflon® treated for water and stain resistance.

This is what the manufacturer says: "Every SCOTTeVEST garment is designed with specially engineered pockets to hold the gear you normally would fumble through a bag or backpack to find. While our clothing won't replace a flight bag altogether, it organizes your key gear that needs to be accessible at all times. Our garments help organize accessories/tech including smartphones, notepads, tablets, keys, sunglasses and much more – leaving your kneeboard much less cluttered or eliminating it completely."

The price of the Q.U.E.S.T. Vest is $175, reduced from $225. To order, visit *www.scottevest.com* or contact:

SCOTTeVEST, Inc.
411 East 6th Street, PO Box 1915
Ketchum, Idaho 83340,
(866} 909-8378

SR-71 Flight Manual
by Richard Graham



The Official Pilot's Handbook Declassified and Expanded with Commentary.

Here's a gift with real heft; a thousand-page book on the fabled SR-71 Blackbird. Not a coffee-table picture book, this is a reprint of the official pilot's manual, with added commentary by Colonel Richard H. Graham. The paperback book is 8.5 x 11 inches, featuring over 600 illustrations, divided into seven sections. It should provide hours of thumbing-through for the curiosity-seeker. The price is $75.

Col. Graham is also the author of several other books on the SR-71, including "The SR-71 Revealed: The Inside Story" and "SR-71: Stories, Tales and Legends". To order, visit *www.quartoknows.com/books/9780760351741/SR-71-Flight-Manual*

FARO Lightweight ANR Headset

If you're like me, you're always looking for a more comfortable headset. And so are most of the important people you'd like to remember with a gift combining utility and durability. FARO has just the ticket, a lightweight (1 oz.) ANR headset that won't muss hair, imprint ears or leave you with a headache. It will require periodic replacement of the earpieces that reside in the ear canal, but several pairs come with the initial purchase.

The FARO AIR headset is advertised to offer 50 dB of noise reduction, and the slim in-cord handset has dual volume controls, an auxiliary audio input jack and a stereo/mono switch. FARO offers a three-year full warranty and 30-day money-back trial period.

The price is $389, U.S. shipping included. To order, visit *www.faroaviation.com*

A Timex® Pilot Wings Watch

Perfect for Pilots

No Holiday Gift Guide would be complete without at least one pilot watch, so Sporty's is offering a new Timex® timepiece, just in time for gift-giving. Tracking current time and zulu time is an important feature in a pilot's watch, and this custom Timex® watch combines that feature with a rugged look and feel. The watch's analog and digital options can handle any two time zones.

"With the great pilot wings, this affordable watch gets it done," says Sporty's Vice President John Zimmerman. "Pilots will be happy to use this watch for years to come."

The reliable construction includes a rugged performance strap that closes with a buckle. This watch has a stopwatch, countdown timer and alarm all built in. An Indiglo® night-light illuminates the dial in low light. The Pilot Wings Watch is water resistant to 330 feet (100 meters) and is also suitable for snorkeling and swimming.

Sporty's Pilot Wings Watch, item #5737A, is available for $69.99. It may be ordered at *www.sportys.com* or by calling 1-800-SPORTYS.

Sporty's CRS Convertible Creeper Seat

If someone you know occasionally has to do work around an airplane in his or her hangar, here's a great gift idea. It can be torture to squat under a wing or nacelle while inspecting or adjusting an item, and even standing on a concrete floor gets tiresome. Sporty's Pilotshop offers this convertible roll-around creeper that will give you a soft place to recline or sit in a low chair.

The CRS Convertible Creeper Seat has six 2 ½ -inch oil-resistant rollers, a ¾-inch steel-tube frame, a padded seat, back and headrest and it weighs only 28 pounds. And it is made in the USA. Every hangar needs one.

Product ID: 22560A

Price: $149.95

To order, visit *www.sportys.com/pilotshop* and search for "creeperseat" or "22560A"

An insider's guide to Trouble-Free Turbocharger Operation

By **Tim Gauntt,** Director, Product Support, Hartzell Engine Technologies

With a little understanding, care and effort, you can achieve a lot more reliability from your aircraft's turbocharger.

It seems like every time I get around a group of pilots, the talk soon turns to turbochargers. And, seemingly, every pilot in the group has his/her own turbocharger horror story.

I guess it's understandable. As the Director of Product Support for Hartzell Engine Technologies (HET), I have the advantage of working around the design, manufacturing, rebuilding and testing of turbochargers every day, so I know a lot about these *mystery* systems. And I also know, contrary to *hangar talk,* that, when operated and maintained properly, the turbocharger is among the most reliable pieces of equipment under the cowling.

With apologies to pilots and mechanics, my opinion is that a lot of what pilots perceive to be wrong with turbochargers has to do with a combination of them not really knowing how to properly operate their aircraft, and the considerable possibility that their mechanic doesn't know how to properly troubleshoot and maintain the unit. Put those two together and it's no wonder turbochargers have gotten a bad rap.

In HET's considerable experience, the majority of the turbocharger returns we receive from the field are found to be free of issues with the unit itself. In most cases, the problems are with the system's installation, inadequate pre-lubrication or other operational issues.

Typically, those operational issues include: an inability of the aircraft to reach altitude, the system's inability to reach the maximum-rated manifold pressure, a surging or dropping off of manifold pressure when climbing or descending, and oil leaks from the compressor or turbine side of the turbocharger.

Turbocharger 101.

Again, because few pilots ever take the time to fully comprehend the individual components of their aircraft, they don't really understand that the turbocharger is not a stand-alone component; it's just one part of a very sophisticated system that, when properly manufactured, installed, operated and maintained, will run to normal engine TBO.

The turbocharger system consists of the turbocharger(s), controller, pressure relief valve, and wastegate, along with the exhaust/intake assemblies leading from and to the engine.

And, while the turbo itself seems like a simple device, it is in fact a very precise component that can be called upon to operate at speeds over 100,000 RPM and at temperatures exceeding 1,650° (F).

Contrary to popular belief, although the turbocharger does convert waste energy (in the form of hot exhaust gasses) into additional 'power', the system is not a power source itself. The compressed gasses produced by the turbocharger increase the density of the fuel/air mixture, which in turn, increases the engine's power output at higher density altitudes.

As I stated earlier, your aircraft's turbocharger system is very complex and operates at extreme speeds and temperatures – two conditions that just go looking for problems. But the good news is, more times than not, you will get indicators of some pending problem before it becomes critical.

Typically, you will get nuisance-related maintenance items, such as a bit of extra oil consumption, a slight leak, a bit of blue smoke from the exhaust, or possibly oil collecting at the exhaust outlet. These are just some of the visual indications that something is not performing as it should.

I routinely remind pilots that a thorough pre-flight is the time to look for these clues. Keep in mind that some of the warning signs are very subtle and easy to miss. Take your time. If you see something you're not used to seeing, you need to get it looked at by a mechanic.

Another highly-effective practice is for owner/operators to be very proactive in their maintenance. Since the turbocharger shares the oil system with the engine, you should routinely change the oil at 25 or 35 hours. And, like other parts of the engine, the condition of the oil can provide an indication of the health of the turbocharger.

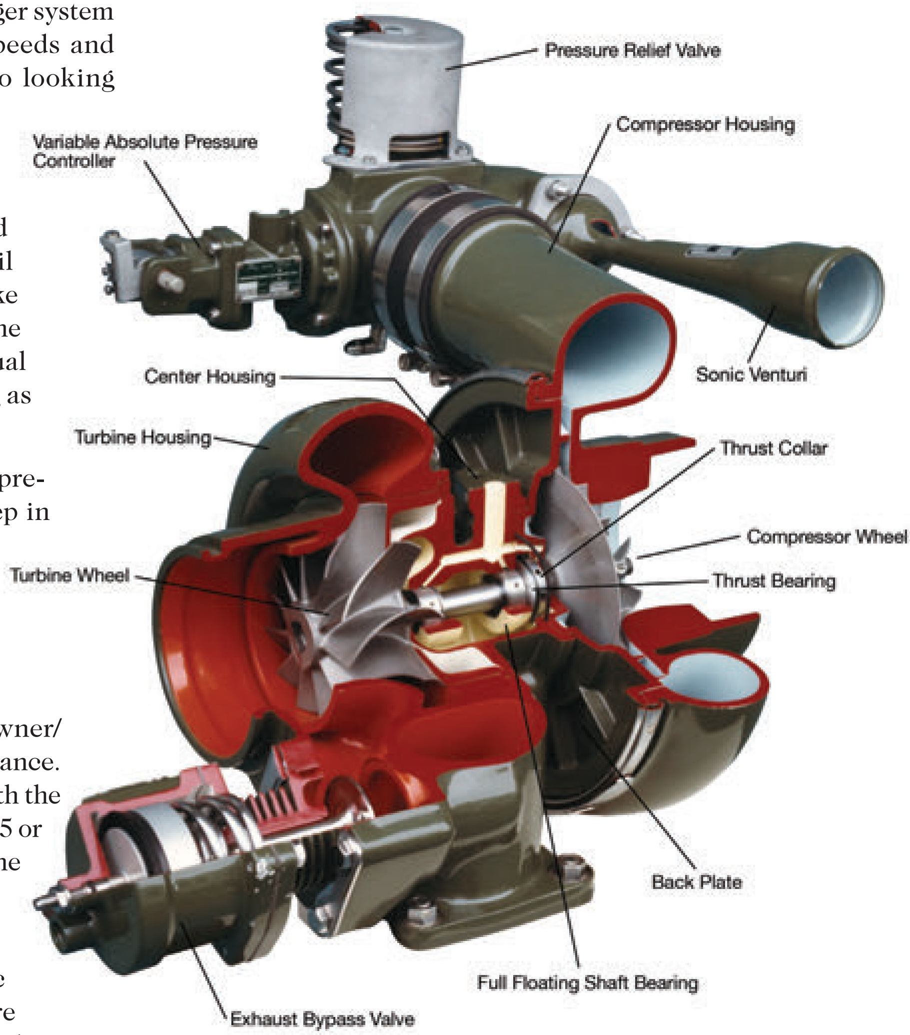
During the oil change, the owner or mechanic should take the opportunity to give the entire turbocharger system a good inspection. Keep the air filter clean and check the security of the intake and alternate air systems to prevent FOD (foreign object debris) from entering the compressor or from robbing the compressor of air. Also, take time to visually inspect all clamps, hoses, ducts and related components of the intake/exhaust system.

The bottom line is: Knowing your engine's typical operating parameters and recognizing differences can help eliminate costly repairs down the road.

Before All Else Fails, Follow The Instructions…

One simple way you and your mechanic can help ensure that your turbocharger system gets you to TBO is to read and follow the Pilot's Operating Handbook (POH). In particular, I mean the section that covers the proper turbocharger cool-down procedures for your aircraft.

The number one enemy of the turbocharger system is heat build-up, and that heat comes in the form of lack of oil, lack of cool oil, hot exhaust and poor power management. As a general rule, all turbocharged engines should be 'idled' for a specific time and power setting to cool the system before shutdown after landing or engine maintenance operations.



Properly following this procedure will prevent two bad things from happening: The first is the continued high-speed rotation of the turbo without adequate oil flow. The second is the development and build-up of abrasive carbon deposits in the oil. (a.k.a. coke).

Remember that the system's lubricating oil is coming directly from the engine's oil system, so shutting down the engine immediately stops the flow to the turbocharger. Most Hartzell turbochargers use full-floating hydrodynamic bearings. Hydrodynamic bearings provide outstanding performance in constant-speed applications, like we have in aircraft installations, but if the turbocharger is still turning at a high rate of speed when oil flow is cut off, these bearings can be damaged. In addition, any stagnant oil remaining around the extremely hot turbine shaft will overheat and 'coke' or burn.

But why is the turbo still spinning at a high rate of speed after landing? Well, it all goes back to proper planning and power management, which includes a normal descent at reduced power settings to stabilize and maintain engine temperatures.

As the aircraft enters the landing phase, engine power is reduced even further and then taxiing is done at low power settings. By the time you've reached the ramp, all engine temperatures should be stabilized and the turbocharger should now be turning at its slowest speed.

But, and I can't stress this enough, even then, depending on the type of system installed, additional cooling time may be required prior to engine shut down.

(HET has produced an informative, short video on the critical importance of proper turbo cool down. Check it out at: *www.hartzell.aero/eo2yU)*

And, while improper pre-shutdown cooling is one of the most common mistakes pilots routinely make, turbocharged, intercooled, high-performance engines

require constant monitoring of the systems throughout all phases of flight.

And all that starts with proper fuel mixture, CHT and EGT management, including proper flight planning to avoid over-temping or thermal shock. As is often the case, good piloting technique is critical to optimum system reliability and performance.

Out With The Old…

Okay, so even with proper operations, sooner or later your turbocharger is going to start showing signs of distress. What are your options?

Turbocharger systems rely on very sophisticated components with tight tolerances and little room for error. Because of that, if your turbocharger needs maintenance the question becomes whether to have it overhauled or exchange it for a new or rebuilt unit?

The cost of a factory-new turbocharger is only slightly higher than a rebuilt unit and there is no core return required. So, you get all new parts and it's hassle free. HET also offers factory-rebuilt units on an exchange basis for most of our models.

Pilots and mechanics often ask what the difference is between a new and a "factory rebuilt" turbocharger. Other than the fact that one is all-new and the other is 'rebuilt' there is really no functional difference.

In fact, the regulatory definition of a rebuilt turbocharger is, in essence, that it has to meet the standards of a brand new unit. When we do a rebuild here, we use some of the original parts, but many of the parts get replaced with new – especially critical parts such as the highly-stressed turbine wheel.

So, if rebuilt and brand new turbochargers are basically the same, what about a "field overhauled unit"? Overhauled units are not required to meet 'new' standards, so they can be less expensive. In most cases, the typical field overhaul shop will reuse more of the original parts than HET typically does. There's nothing wrong with that, as long as they follow the latest manuals, service bulletins and service instructions for overhauling our turbochargers, valves, controls and wastegates, and replace all the required parts as indicated.

The operative statement here is: "Follow the latest instructions and manuals…" So you need to talk with the overhauler and ask if they have and comply with all the manufacturer's latest instructions before you consider their shop.

Also, ask them for a detailed list of all the components they change during an overhaul. If they won't supply one, move on to another shop. And if they do give you a list, pay close attention to whether or not they change critical components like the turbine wheel assembly.

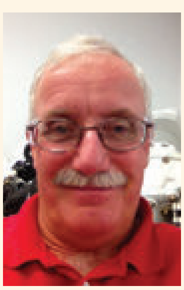
Components like the turbine wheel are subject to fatigue and thermal stress. And the effect of fatigue damage is cumulative, and not always obvious, which makes it very hard to detect during an inspection.

For that reason, HET's overhaul manual requires replacing critical components with new parts, which is the prudent course of action. It has proven to be the best way to help ensure that critical parts will make it through to the next overhaul cycle.

Hartzell has also initiated a Recommended Service Facility (RSF) program. Participating turbocharger repair and overhaul facilities have agreed to follow the HET overhaul manuals and only use genuine HET parts. Currently, Quality Aircraft Accessories of Tulsa, Oklahoma (*www.qaa.com*) is an HET RSF, so if you've grown fond of your turbo and don't want to trade it in, it would be a good idea to consider QAA.

Another point to consider when making the *new vs. rebuilt vs. overhauled* decision is that new and, often times, rebuilt units will offer the benefits of having more new-generation components that are manufactured using the latest equipment, materials, and techniques. Plus, new and rebuilt units are covered by HET's warranty.

So, while the resulting new-generation turbocharging systems may not give you any more performance than the original units, the much-higher degree of precision will help ensure that, along with some judicious operation and preventative maintenance by you, today's units will deliver years of safe, trouble-free performance. T&T



About Tim Gauntt, Director, Product Support, Hartzell Engine Technologies
Tim Gauntt is the Director of Product Support for Hartzell Engine Technologies LLC.
Tim has been active in the aviation industry for over 30 years as a general aviation mechanic, IA, AMT Part 147 instructor and various other technical support related positions.

From the Flight Deck

by **Kevin R. Dingman**

Freezing Level

Boots, Bleeds, Benefits and Beliefs

He who demands everything that his aircraft can give him is a pilot; he that demands one iota more is a fool.

–Len Morgan.

You've heard it before and have likely said it yourself: being on the ground wishing you were in the air is better than being in the air wishing you were on the ground. Inflight icing can make us wish we were on the ground. Structural icing occurs when supercooled water freezes on impact with any part of the aircraft during flight. Airframe icing can lead to reduced performance, loss of lift, altered controllability and ultimately a stall and loss of control. These are very bad things and wishing won't help.

Pilots that lean more towards VMC flight planning may shake their heads and wonder why anyone would launch into known-ice in the first place. There are two classifications of deicing systems in GA: those for flight in known-icing and "non-hazard" systems that provide time to escape from icing. Known-ice certification is rigorous. In addition to protecting a dozen or so surfaces and components that include the obvious leading edges, windshield, engines and air data probes, the manufacturer must evaluate aircraft tolerance to accumulation on unprotected surfaces such as antennas, landing gear, nose cones, leading edges of flight controls and tip tanks. Most *T&T* readers operate aircraft in the first classification--certified for flight into known-ice. The decision to fly into ice lies in our confidence in the system and experience with ice. The worst icing is common in just the top 1,000 feet of cumulus clouds when the temperature is 0°C and lower and ice normally resides in a layer of cloud only two or three thousand feet thick; it can usually be transited quickly. That being said, those that fly in icing know to get out of it as soon as possible, to always use deice and anti-ice equipment and to have a plan if the equipment can't keep up or if it fails.

We Have a Problem

Remember the scene in the movie Apollo 13 when the switch is activated to stir the O_2 bottle? The camera follows the electrical current along the wire to the tank. When it reaches the O_2 tank, it explodes. When I actuate a control that is seldom used like the alternate air, alternate static or the boots, that scene plays through my mind. You likely won't explode when you hit the deice switch but it only takes one pneumatic hose or a bleed-air duct coming unfastened for you to lose some, or all, of your system. If the deicing system fails or if it can't keep up, consider this: In NTSB studies, a pilot diverting due to icing was effective in less than 25% of the cases that reached the required threshold of an accident or reported incident. The predominant sequence of events involves a stall followed by loss of control and impact with the ground. Of the less than 25% that made it to an airport, sufficient performance was lost during the approach so as to force descent below the glide path. Of those that made it to an airport and to a runway, a large number resulted in hard landings. These statistics are why we should avoid or exit all types of icing-- even when our system is working properly.

Varieties of Ice

Clear ice is both clear and smooth. Supercooled water droplets or freezing rain strike a surface but don't freeze instantly. It generally conforms to the shape of the airfoil. Rime ice is rough, opaque and formed by supercooled drops rapidly freezing on impact. Often "horns," "bowls" or other protrusions are formed and project into the airflow. Rime ice appears white in color. Mixed ice is a combination of clear and rime ice. Frost ice is the result of water freezing while the aircraft is stationary. Frost with a surface texture similar to forty-grit sandpaper is enough to disrupt an airfoil's boundary layer airflow causing increased drag and a premature aerodynamic stall.

SLD ice (Supercooled Large Droplet) is similar to clear ice but because droplet size is large, it extends to unprotected parts of the aircraft and forms larger ice shapes. **Runback** ice forms when supercooled water moves aft of the surfaces beyond the protected area and then freezes as clear ice. If we encounter any of these types of inflight ice, a pilot report is mandatory and should include the type of ice and level of intensity: trace, light, moderate or severe. ATC will also want to know the OAT at the time of the encounter. The gamut of systems to combat these types of icing runs from liquid, to pneumatic boots, to electrically heated components, to bleed air systems. Each system presents varying degrees of weight, cost, effectiveness and reliability.

Thermal Systems

A thermal system (bleed-air or electric) may operate one of two ways: fully evaporative or wet. In the evaporative case, sufficient heat is provided to cause supercooled water to completely evaporate. This has the advantage of protecting the aft, unheated portion of the airfoil. A wet thermal system can only prevent water from freezing. It requires less energy but it can fail to prevent runback ice, which forms when the running water passes aft of the protected surface and freezes. Even a fully evaporative system may transition through a wet phase as it heats and cools. The ideal method for operating a fully evaporative system is to activate it prior to entering potential icing conditions, thus allowing the surface to stabilize at the required temperature.

Electro-thermal

Electro-thermal systems use resistive circuits buried in the airframe, windshield or propellers to generate heat. The system only needs to melt the contact layer of ice for wind-shear to then shed the remainder.

TKS (Tecalemit – Kilfrost – Sheepbrige – Stokes)

The TKS system uses a glycol-based fluid which exudes through 0.0025-inch-diameter holes in panels on the leading edges of the wings and horizontal stabilizers. The fluid lowers the freezing point of water preventing it from freezing and adhering. The system can be installed as a known-ice or non-hazard system depending on redundancy, additional components and type of aircraft.

Pneumatic Boots

The most common deicing system for GA aircraft, including some jets, uses pneumatically inflated rubber boots on the leading edges of airfoil surfaces. This normally includes the wings and empennage, but may also include struts and cargo pods. The system uses relatively low pressure air to rapidly inflate and deflate the boot. The principal drawback to boots is the aircraft will operate with ice accretions for the majority of the time in icing conditions and it provides no protection from runback ice. Also, the only time it will be free of ice will be immediately after cycling the system.

Ancestor Worship: Ice Bridging

Early pneumatic boot designs had relatively low volume air supplies to draw from, and were slower to inflate and deflate. A phenomenon which was thought to be occasionally observed with these systems was known as "ice bridging," in which the boot expanded under the ice and stretched it without breaking its structure. This led to a space beneath the ice shape which allowed the boot to subsequently inflate and deflate with no effect. The problem was addressed by allowing a particular thickness of ice to develop before inflating the boot. Once the requisite thickness was attained, the boot inflation would shatter the ice and clear it off the surface. With the current, rapidly inflating systems, there is almost no evidence which supports the existence of this phenomenon.

From the NTSB in 2008: "For 60 years, pilots have been taught to wait for a prescribed accumulation of leading-edge ice before activating the deice boots because of the believed threat of ice bridging. In theory, ice bridging could occur if the expanding boot pushes the ice into a frozen shape around the expanded boot, thus rendering the boot ineffective at removing ice. The Safety Board has no known cases where ice bridging has caused an incident or accident……" Leading-edge deice boots should be activated as soon as icing is encountered, unless the aircraft flight manual or the pilot's operating handbook specifically directs not to activate them.

Exit Strategy

Icing accidents result from a combination of increased weight, increased drag, loss of lift, and a decrease or loss of thrust caused by induction air blockage and propeller or compressor blade contamination. Whether thermal, "weeping wing" (a.k.a. TKS) or pneumatic, deice systems give your aircraft more utility and safety but are designed to get you out of a bad condition. Avoid ice as much as possible (standard temperature lapse rate is 2.0°C / 3.5°F per 1,000 ft.) and exit it promptly when encountered. Because of accumulation on unprotected areas, consider adding a few knots to your configuration and approach speeds. Know your system, test your system and don't hesitate to use it early. If you demand one iota more than it can give, you may find yourself wishing you were on the ground. T&T

Kevin Dingman has been flying for over 40 years. He's an ATP typed in the B737 and DC9 with 21,000 hours. A retired Air Force Major, he flew the F-16 then performed as a 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

Twin **Proficiency:**

by **Thomas P. Turner**

Night Risk Management

It's the time of year when you are more likely to be flying in the dark. Objectively, it shouldn't make much difference, especially if you're flying IFR—just fly the procedures and keep your eyes on the instruments, and you should be all right. The record shows, however, that the rate of accidents at night is wildly out of proportion to the percentage of flying done in the dark. What can we do to mitigate the added risk?

The Record

Countering the argument that "the airplane doesn't know if it's light or dark out," the record clearly shows a greater rate of aircraft accidents at night. The AOPA Air Safety Institute says that while "... only 19.2 percent of daytime accidents resulted in fatalities…, over one-third (34.6 percent) of all night accidents were fatal ... At night, nearly half of the accidents in VMC were fatal ... compared to nearly three-fourths of night IMC accidents."

Bad Is Worse At Night

At night, what might otherwise be inconveniences can become life-threatening emergencies. Early in my flying career this happened to me:

I was tasked to fly a Beech Baron from its base in northern Kansas down to Wichita. I'd never flown this particular airplane before; I was picking it up to fly it to the shop for the Baron's single throw-over controls to be replaced with dual control wheels, so I could provide transition training to the thirty-year-old Baron's new owner.

I hitched a ride up with a friend in a Piper Warrior. After completing a preflight inspection of the Baron and its logbooks, I waved my friend homeward. We'd had stronger-than-expected headwinds on the way up, and it also took a lot of time for the FBO to find the Baron's keys for me, so my departure was delayed enough to make it dark before I completed the hour-long flight back home.

I fired up the piston twin and took off, VFR, heading southward. About a half-hour out of Wichita, I noticed a thin layer of ground fog developing. ATIS at Wichita's Mid-Continent (now Eisenhower National) Airport reported IFR conditions, but well above minimums. So, I called Center and picked up an IFR clearance in the air.

On vectors to intercept the localizer for the ILS, as it was getting dark, I turned on the instrument panel lights. Nothing happened. It's hard to check panel lights for operation in daylight, but I later learned a faulty rheostat prevented them from coming on when I needed them. I'd not gone out of my way to shade the instruments and check that the panel lights worked before I took off, even knowing I'd be flying at night. Happily, I had a couple of working flashlights with which to see the instruments during approach set-up and landing.

There were a lot of "I should've done this" or "I should not have done that" lessons from this experience, lessons I've absorbed and integrated since that time. As a result, I've come up with some techniques for minimizing the risk for night flight.

Night Safety Do's And Don'ts

Do Not:

- Fly at night without a thorough weather and NOTAMs briefing. No exceptions. Beware of marginal VFR reports, converging temperature/dewpoint spreads, temperature inversions, and reports of winds blowing off large bodies of water. Each can lead to rapidly deteriorating ceilings or visibilities you can't detect visually at night before you're in them.
- Make a night flight immediately after airplane maintenance or an annual inspection. A post-maintenance flight should be a day, VMC shakedown.
- Fly at night the first time you fly a specific airplane. Until you fly it yourself, you don't know what works and what doesn't.

- Fly at night in an airplane you've not flown recently.
- Fly at night if you have any uncorrected electrical glitches.
- Fly past a good airport if you have a problem at dusk or in full darkness.
- Fly to the limit of the airplane's fueled range at night. Landing and refueling options are reduced after hours, and you may need to fly farther to make it to an alternate airport.
- Fly after a full day of work unless you get some real rest before departure. You need to know you won't be too fatigued, not only at takeoff, but also at the end of your night flight.

Do:

- Plan a night VFR trip as if you were planning for IFR, including routes and minimum altitudes for each flight segment, alternate airports, and added fuel reserves.
- Use checklists, even when you are comfortable in the airplane. Complacency can be worse at night, when it's harder to see.
- Actively monitor electrical load and alternator/generator output throughout the flight. Divert and land at the nearest suitable airport at the first sign of an electrical problem.
- Crosscheck instruments and their power source indicators frequently, and land quickly if a failure occurs.
- Check "fuel remaining" for your destination regularly. Divert and land at the nearest suitable airport if fuel reserves drop below limits.
- Perform a "blind cockpit check" before takeoff. While sitting in the cockpit, be able to touch any indicator or control without looking. Develop this level of comfort with the airplane before you fly it at night.
- Practice emergency checklists. It's even harder to use a printed emergency checklist in the dark.
- Cancel any night flight when you are not completely confident both you and the airplane are airworthy.

Disorientation in the Dark

The common practice of taking off and picking up an IFR clearance in the air can be extremely hazardous in the dark, especially in marginal conditions. Here's an example from the NTSB:

The pilot of a multiengine airplane contacted tower controllers to obtain an IFR clearance for a nighttime departure. Marginal visual flight rules conditions prevailed, with ceilings 1,000 broken, 1,700 overcast, and six miles' visibility. The controller was not able to access the flight plan information and requested that the pilot provide him the full flight plan information by radio. The pilot asked if it would be easier to take off under VFR and pick up a clearance in the air. The controller replied that if the pilot departed VFR he would only need the aircraft type information and his requested direction of flight. The pilot elected to depart VFR.

Radar data showed the airplane climbed to about 2,200 feet MSL (about 1,680 AGL). At this altitude, and when the airplane was about three nautical miles from the airport, it began a descending left turn, followed by a right turn, losing about 700 feet of altitude during this time. The airplane then began a climbing left turn. During the turn, the airplane initially climbed about 400 feet, descended about 400 feet, and then climbed again about 1,300 feet before reaching its peak altitude of 2,800 MSL. The final recorded radar point was 0.1 nm from the accident site, and the calculated descent rate between the final two radar points was more than 5,000 feet per minute.

Post-accident examinations of the airframe, engines, and propellers, revealed no evidence of mechanical malfunctions or failures that would have precluded normal operation. The flight path, which was not consistent with the intended course, the airplane's repeated climbs and descents, and the loss of airplane control and high-speed impact are consistent with the known effects of spatial disorientation. Based on this evidence, it is likely that the pilot experienced spatial disorientation after the airplane inadvertently entered clouds at night, which led to his failure to maintain airplane control.

Being a good IFR pilot who flies IFR most or all of the time does not mean you'll be good at flying in marginal conditions at night. In fact, flying without the "comfort" of flying filed routes and altitudes may be far riskier at night—additionally so in marginal conditions. Unexpectedly losing visual references at night while flying in unpracticed and uncomfortable conditions can be extremely disorienting. It's best to get your clearance on the ground before taking off, even if that means you need to re-file your entire flight plan.

Night Risk Management

There's a lot more to know about night flight, including a good section in the Airplane Flying Handbook (FAA-H-8030-3A), Chapter 10. It may not be the norm for pilots of multiengine and turbine pilots to review this most basic of flying texts. But, reviewing and using that knowledge will help you manage the risks of flying at night. T&T

Thomas P. Turner is an ATP CFII/MEI, holds a Masters 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.

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TRU's ProFlight® Pilot Training Earns FAA Qualification for its King Air 350 Pro Line Fusion Distance Learning Program

TRU Simulation + Training Inc. announced on September 16 that customers of its ProFlight King Air 350 pilot training program now have the option to train at home through its FAA-approved distance learning option for BE-300 recurrent training. TRU's East Coast ProFlight Pilot Training center was the first to offer instruction on the new Pro Line Fusion equipped King Air 350 aircraft and the only training provider to offer an online learning option for recurrent training.

The new distance learning option gives customers the flexibility to receive 100% of their Aircraft Systems Training online, allowing them to focus all time spent at the training center towards simulator training scenarios. TRU is also offering its proprietary Current 365® training, which provides access to the online training suite throughout the year, as opposed to a typical one-time recurrent training event. Customers that prefer to complete their ground school training on-site in a classroom will still have that option.

"TRU's ProFlight pilot training maximizes learning potential by empowering our customers to take control of their training experience, customize the program to best fit their learning preferences, and fundamentally reduce their time spent in the training center," stated David Smith, TRU's Vice President of Training Centers. "Our customers often have hectic schedules and the flexibility of an FAA-approved distance learning option allows them to accomplish a large portion of their recurrent training requirements on the road or from the comfort of their own home."

TRU's comprehensive ProFlight pilot training offering for the new-production Beechcraft turboprop includes an initial type-rating course, an introduction course on the Rockwell Collins Pro Line Fusion avionics package, and a recurrent training program as well as an FAR Part 135 training program. ProFlight instruction combines use of a King Air 350i full motion flight simulator and proprietary Level 6 flight training device for enhanced avionics training capability in a modern classroom setting that incorporates interactive animated courseware for all aircraft systems.

More information is available at *www.TRUSimulation.com.* T&T

EN ROUTE

GULF COAST AVIONICS completes its first ADS-B Compliant Garmin Touchscreen upgrade on a Citation CJ1 Business Jet

ADS-B compliant touchscreen upgrade gives the legacy Citation's pilot/owner new-generation capabilities and increased situational awareness.

Rick Garcia, President and CEO of Gulf Coast Avionics Corporation, has announced that his company recently completed an ADS-B compliant Garmin touchscreen avionics upgrade on a 1998 Citation CJ1 (525).

"The aircraft is owned and flown by a Tampa-based businessman who primarily flies single-pilot," Garcia said. "He recently moved up to the CJ1 from a Piper Cheyenne and he wanted to do an avionics upgrade that would not only ensure the Citation's

ADS-B compliance, but also deliver a number of operational and situational awareness benefits that would make the transition easier."

Matt Schloss, Sales Representative for Gulf Coast Avionics, explained that the Citation CJ1 upgrade included:

- Dual Garmin GTN 750 Touchscreen GPS/NAV/COMM/MFDs
- Dual Garmin GTX 345 ADS-B "Out" and "In" Mode S extended squitter transponders
- WAAS LPV approach capability
- Garmin Flight Stream 210 gateway for wireless iPad cockpit connectivity.

"This was our shop's first ADS-B compliant Garmin GTN touchscreen installation in a CJ1 and with our prior experience with Citations it turned out to be a pretty straightforward project," Schloss said. "We did have to create a new wiring harness to interface the new avionics with the legacy Honeywell EFIS and autopilot. Everything else was done following the JetTech STC."

"While the Garmin GTN 750 touchscreen units will add a great deal of functionality and operational convenience to the panel, the owner is going to really benefit from the WAAS LPV approach capability, which will enable the owner to get into airports that were previously inaccessible," he said. "The new Garmin Flight Stream gateway will also give him the ease of wirelessly linking his iPad to the 750's. This capability will greatly simplify cockpit management, reduce workload while increasing situational awareness."

"The customer was absolutely thrilled when he saw the new panel for the first time," Garcia said. "He now has a reliable airplane that will meet his business and personal travel needs well into the future."

Garcia also stated that, thanks to the short turn time on this installation and the capabilities of the completed panel, GCA has been awarded a similar project to upgrade a Citation II that is owned and operated by a central Florida-based Part 135 charter company.

"With the ADS-B mandate approaching quickly, more and more operators are coming to us to have their aircraft made compliant," he said. "All of the Gulf Coast Avionics facilities are seeing increased business."

For a copy of the GCA catalog or for more information, visit: *www.GCA.aero* T&T

Hawker 400XPR achieves FAA certification; first full upgraded 400XPR inducted

Beechcraft Corporation, a subsidiary of Textron Aviation, Inc., announced on September 15, 2016 that it has received Federal Aviation Administration (FAA) certification on all 400XPR program elements. All components of the exclusive factory-approved, engineered and supported upgrade package are available for installation on Beechjet 400A/Hawker 400XP aircraft at Textron Aviation service centers worldwide. The first full Hawker 400XPR factory-completed aircraft is expected to be delivered later this year.

"We offer the best – and the only factory-approved – upgrade solution for Beechjet 400A/Hawker 400XP owners, significantly improving their aircraft's performance, operating cost and resale value," said Brad Thress, senior vice president, Customer Service. "Our customers have been extremely impressed with the aircraft's outstanding performance and we are eager to provide our 400A/400XP owners and operators with the confidence that comes only from an upgrade engineered and supported by the original manufacturer."

The 400XPR program is fully customizable, can be performed in stages or in unison and can be completed in as little as 12 weeks. The full Hawker 400XPR package includes Genuine Hawker Winglets and new Williams International FJ44-4A-32 engines, a combination that offers a 33 percent increase in range along with improvements in runway and hot/high performance. The Hawker 400XPR has a range of 1,970 nautical miles with four passengers departing a 5,000-foot elevation airport at 30°C. The Williams International FJ44-4A-32 engines enable the Hawker 400XPR to climb directly to FL450 in only 19 minutes at max takeoff weight.

In addition to winglets and new engines, the 400XPR offers customers the option of retaining their aircraft's existing Rockwell Collins Pro Line 4 avionics or upgrading with Rockwell Collins Pro Line 21 avionics. Customers can also choose between multiple exterior repaint and interior refurbishment options, along with a customized, factory certified re-conditioning that includes Textron Aviation's industry leading ProParts coverage and a five year Williams International engine warranty.

For more information on the XPR upgrade program, visit *http://txtav.com/en/service/400xpr.* T&T

EN ROUTE

Blackhawk Pursues King Air 350 Engine Upgrade

In an announcement from company executives on August 30, 2016, Blackhawk Modifications, Inc. unveiled details about their newest XP Engine + Upgrade program, specifically for the King Air 350. Blackhawk is developing a Supplemental Type Certificate (STC) that will allow the installation and operation of the Pratt & Whitney Canada PT6A-67A engine, replacing the King Air 350's existing PT6A-60A engines. The XP67A Engine+ Upgrade is currently installed on Blackhawk's King Air 350 that will be used as the STC test aircraft during the experimental flight process. Blackhawk anticipates receiving the STC in May of 2017.

The PT6A-67A engine is a 1,200-SHP power plant that will replace the existing 1,050 SHP PT6A-60A engines currently certified on the King Air 350 model. Blackhawk's STC will flat-rate the engine to 1,050 SHP, to take advantage of more than 400 thermodynamic shaft horsepower per engine in climb and cruise settings (1,825 ESHP). This higher thermodynamic rating will also improve takeoff and climb performance in high altitude and hot ambient temperature conditions.

The initial performance results have exceeded forecast projections. In hot climate conditions, the XP67A will climb from sea level to its service ceiling of FL350 in as little as 18 minutes – more than doubling the rate of climb. Stock engines take 45 minutes. Typical cruise speeds are increased by up to 37 KTAS and can settle in at up to 340 KTAS if an operator chooses to fly at maximum engine power limits. Operators looking for increased endurance and range can throttle back and extend capabilities due to better specific fuel consumption ratings. Blackhawk's STC will include a new Flight Manual Supplement with full performance for flight planning purposes.

"We worked very closely with Pratt & Whitney to bring to market the best PT6 engine model that will boost the King Air 350 to the next level," said Jim Allmon, President and CEO of Blackhawk. "The PT6A-67A pushes the King Air 350 above and beyond what can be achieved

EN ROUTE

with many jets. The XP67A will attain jet-like speeds, can carry twice the payload much farther, and will burn a fraction of the fuel while lowering maintenance, operating and acquisition costs. It reintroduces the King Air 350 to a larger group of private, business and commercial operators as well as the special missions arena."

The PT6A-67A engine will require a more robust propeller assembly. Blackhawk is now flying with the German-designed five-blade natural composite propellers from MT. Their diameter of 102 inches provides more ground clearance, and the MT propellers have unlimited blade life, are field reparable and employ large nickel alloy leading edges for superior erosion protection. The ground RPM restrictions are removed as well as the Ground Idle Solenoid to allow smooth taxi operations. The MT propellers also offer significant reductions in noise and vibration levels while demonstrating a positive contribution in overall performance. Hartzell 105-inch diameter five-blade composite propellers are also likely be included in the initial certification plan, as an option. Raisbeck Engineering is working on a migration path to upgrade its newly-certified Swept four-blade aluminum propeller assembly to be compatible with the PT6A-67A installation.

For more information, visit *www.blackhawk.aero.* T&T

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OWNER: Village Press, Inc. PUBLISHER: Village Press, Inc EDITOR: LeRoy Cook • HEADQUARTERS OF PUBLISHER & PUBLICATION: 2779 Aero Park Dr., Traverse City Michigan 49686 • STOCKHOLDERS: Village Press, Inc., David B. Moore, J. Scott Lizenby • BONDHOLDERS, MORTGAGEES,OTHER SECURITY HOLDERS: Fifth/Third Bank – Grand Traverse CIRCULATION: Average No. Copies each issue during preceding 12 months: A. Total Copies Printed (Net press run), 17,813; B. Paid and/or Requested Circulation: 1. Mail subscriptions, 8,800; 2. Paid in-county subscriptions, 4; 3. Single copy sales, 0; 4. Other classes mailed through the USPS, 0; C. Total Paid Circulation, 8,841; D. Free Distribution by Mail,1. Outside County, 8,674; 2. In County, 2; 3. Other Classes, 81; 4. Outside the mail, 0; E. Total Free Distribution (Sum of D 1-4), 8,757; F. Total Distribution (Sum of C and E), 17,598; G. Copies Not Distributed, 215; H. Total (Sum of F and G), 17,813; I.Percent Paid and/or Requested Circulation, 50; CIRCULATION: Single Issue nearest filing date: A. Total Copies Printed (Net press run), 17,450; B. Paid and/or Requested Circulation: 1. Mail subscriptions, 8,460; 2. Paid in-county subscriptions, 0; 3. Single copy sales, 0; 4. Other classes mailed through the USPS, 0; C. Total Paid Circulation, 8,461; D. Free Distribution by Mail, 1. Outside County, 8,787; 2. In County, 0; 3. Other Classes, 3; 4. Outside the mail, 0; E. Total Free Distribution (Sum of D 1-4), 8,790; F. Total Distribution (Sum of C and E), 17,251; G. Copies Not Distributed, 199; H. Total (Sum of F and G), 17,450; I.Percent Paid and/or Requested Circulation, 49;
J. Scott Lizenby, Financial Officer

by David Miller

Thanks, Arnie

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 fly a Citation M2. You can contact David at davidmiller1@sbcglobal.net.

Do you remember where you were when you earned your pilot's license? How about exactly where you were standing when you decided to become a pilot?

I do.

It was the Spring of 1965, on a Friday afternoon. I was in junior high school. Atwell Junior High in Oak Cliff, a suburb of Dallas. I lived three blocks from school and walked home most days.

I had a few "Flying" magazines scattered around the house, but the aviation bug had not really infected me yet. My local airport, Redbird (now Dallas Executive) was about three miles from home. Right off the end of runway 31 was Oak Cliff Country Club, site of the PGA tour event.

Headed home and probably daydreaming, I heard a small rumble in the distance. It quickly grew to a whine, then a thunderous roar seeming to shake everything around me. The only thing I could see was a small spec on the horizon. Within seconds, I could make out the silhouette of an airplane. It was a Jet Commander, taking off from Redbird. And it wasn't climbing. Instead, it accelerated to about 300 knots and leveled at 200 feet, strafing the golf course and me as it made a sweeping left turn to the north.

It was so close I could see the pilot in the left seat and the tail number.

N1AP

It was Arnold Palmer. He had "missed the cut" in the tournament and wanted to say "so long" to his golfing buddies in his own special way. Those CJ610 turbo jets were screaming and belching fire and I was in awe.

I stood there frozen as he slowly climbed into the afternoon sky. At that very moment, I decided I didn't want to be a great golfer like Arnold Palmer.

At that moment, I decided I wanted to be a great pilot like Arnold Palmer.

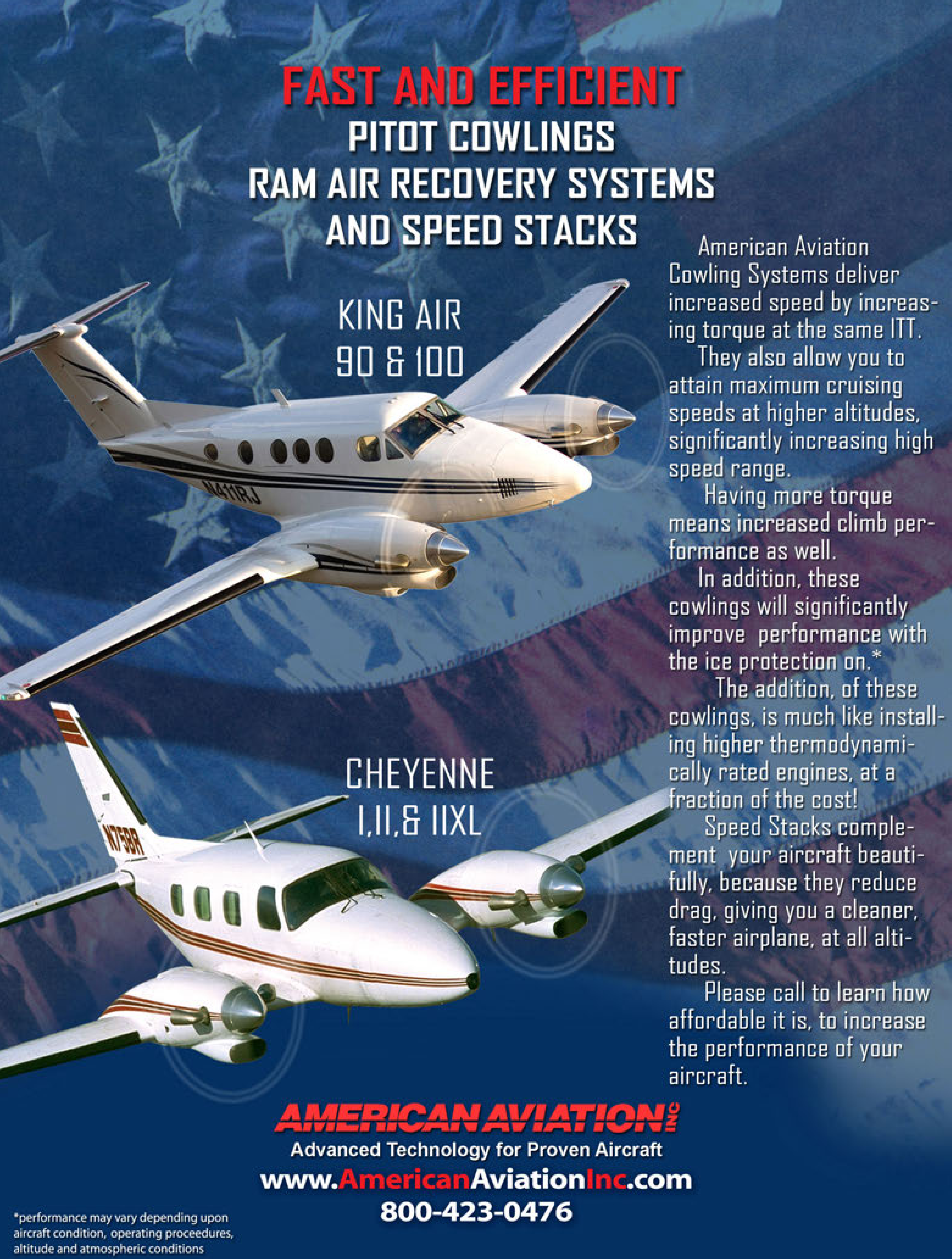
I didn't have the honor to meet him until forty-nine years later, at the Citation Jet Pilots Hall of Honor Ceremony, in White Sulphur Springs, West Virginia. As I finished my story to three hundred guests, Arnie slowly took the stage.

Grinning from ear to ear, he said, "Yeah, I think I remember that day. It's a good thing the FAA wasn't around."

Arnie, you are the reason I became a pilot. Thank you for changing my life.

We will all miss you.

Fly Safe.



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