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Contents

February 2018 • VOL. 22, NO. 2



4



13



19



24



27

- 2 Editor's Briefing**
2018: The Year of
Flying with a Purpose by
Dianne White

Jet Journal

- 4 The Cirrus
Vision Jet**
The Cirrus Lifestyle Now
Flies at Jet Speed
by Dianne White
- 13 Becoming a
Jet Pilot**
by Jacob Tyler
- 19 Unified Flying
Theory**
by Thomas P. Turner
- 22 Five on the Fly**
Five Questions with
Carl Wolf
by Rebecca Groom Jacobs
- 24 Cracked Cylinders**
by Kevin Ware
- From the Flight Deck**
- 27 Control Freaks**
by Kevin R. Dingman
- En Route**
- 31 MightySat Fingertip
Oximeter**
- On Final**
- 32 More or Less**
by David Miller

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2018: The Year of Flying with a Purpose

How are you doing on your New Year's resolutions? Among my aviation-related goals for 2018 were 1) develop a plan that will create discipline in keeping my flying current and sharp, and stick to it, 2) fly at least one charitable mission per month for Angel Flight, 3) add a rating, and 4) convert my logbook to an electronic one, preferably on my iPad, and 5) do more flying in my pristine little 1975 Cessna 172M, an aircraft that has been in my family since new and in which I originally earned my license.

This column is mainly about goal No. 2, although I plan to share how I'm doing on my other goals later this year. You know, it's that accountability thing where if you write down your goals and announce them publicly, it will motivate you to actually follow through with them.

Angel Flight Central, headquartered in my hometown of Kansas City, serves people in need by arranging charitable flights for health needs or other humanitarian purposes. The organization serves a 10-state region and collaborates with other Angel Flight organizations across the country to connect flights.

While I have been signed up as an Angel Flight pilot for a couple of years, I have any number of reasons, or excuses, of why I hadn't become active: I had the wrong airplane, didn't have time, or missions conflicted with other commitments. I decided late last year that was going to change, and as a side benefit it would help me achieve goal No. 1 above: fly regularly to stay sharp. The responsibility of flying Angel Flight passengers makes you tighten up your preflight planning, organize your flight bag a little better, show up ahead of schedule and have your plane in tip-top shape. While I strive to do those things with every flight, I can tell you there is a difference between when you are flying just yourself or you are flying Angel Flight passengers. They have been through some incredibly tough times: brutal cancer treatments, surgeries, tests and long days and nights away from family and home. Because of that, you make

a conscientious effort to be your best. You want this trip to be the least stressful thing they must deal with.

Since November, I've completed three missions – all of which have been rewarding. The patients and their families are thankful for the volunteer efforts of pilots. One patient, who is fighting liver cancer that has spread to his bones, served in the Navy during the Viet Nam war as a radar operator aboard a mine sweeper. Spotting my Naval Academy shirt (yes, I'm THAT mom), we struck up a conversation about his service and that of my daughter's. Having had a lifelong fas-



A recent Angel Flight mission accompanied by my daughter Abby (far right).

cination with aviation, he was thrilled when I invited him to sit up front with me in the copilot's seat. He asked great questions and learned how to follow our flight path on ForeFlight with my iPad. He promised me that after he beat this horrible disease he would sign up to be a mission assistant or a ground transportation angel. I told him he could fly with me anytime.

When I signed up for Angel Flight, it seemed like a great way to give back while keeping my flying skills sharp. But it's had a much deeper impact on me. It's made me realize how abundantly blessed I am – we all are – as pilots and aircraft owners. In this current season of cultural crassness and shout-downs, I've found peace and purpose in this kind of flying. It is what I can do, right now, to make a small difference.

As for my other four 2018 goals, I've got 11 months make it happen. Now that you're in on it, guess I better get started. 

Dianne

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Jet Journal

The Cirrus



Vision Jet

The Cirrus Lifestyle Now Flies at Jet Speed

by **Dianne White**

Photos courtesy **Cirrus Aircraft**



Cirrus has certified the lowest cost and easiest-to-fly turboprop aircraft on the market. With a base price under \$2 million and a cockpit that resembles that of its SR22 brethren, Cirrus hit the mark in creating the perfect step-up for its large piston aircraft install base. For those SR22 owners who yearn to fly higher, faster and with more cabin space, the Vision Jet will more than satisfy. The cockpit commonality, industry-leading safety systems (including a parachute) and uncomplicated, single turboprop operation eliminates any angst about attaining that first type rating.

For all its advanced systems and carefully considered pilot ergonomics, you get what you pay for when it comes to performance. Cirrus makes no bones about what the little jet can and can't do. Its sweet spot is "800 pounds and 800 nm," with a top altitude of FL280. But what it lacks in range/payload, it more than compensates with its spacious cabin, ease of operation, low operating costs and its striking ramp presence.

Background

When Cirrus began to consider "what's next" in the early 2000s, they focused in on a logical turbine step-up from the SR22. The design philosophy was straightforward: keep it simple, keep it safe, keep it economical, and make it familiar through its Cirrus-like cockpit ergonomics and flight deck technology.

"In the \$2 to 3 million range, you have a big open space between our piston airplanes and turbine airplanes. That's where we are aiming for the Vision Jet to fit," said Matt Bergwall Cirrus director, Vision Jet Product Line. "Our customers are people who are early adopters who are leaning forward. The Vision Jet was designed with them in mind."

Why a single turbofan rather than a turboprop? Bergwall cited the design goal of simplicity. "It was the most natural solution. Our customers want to get away from a prop and are ready to get into an actual jet. One highly reliable, fuel-efficient turbofan equipped with FADEC is not only simple

to operate, but helps us get to the price point and direct operating costs we were aiming for."

What started as a secret project in a Duluth, Minnesota garage eventually resulted in its first public unveiling in 2007. Then the economic downturn hit, leaving Cirrus short on cash to devote to the aircraft's development, as well as manufacturing assets such as tooling. According to Bergwall, Cirrus never shelved the project, but chose to slow it down. Engineers still assigned to the project focused on taking risk out the aircraft and their sole flying prototype continued to fly. In 2011, Cirrus was purchased by China Aviation Industry General Aviation, which provided sorely needed capital and allowed the Vision Jet team to resume development in earnest.

At last, the aircraft was certified in October 2016, with first three deliveries at the end of 2016. The company delivered 30 aircraft in 2017 and expects to double that in 2018. With a backlog of 600 orders, Cirrus hopes to continue to increase its production rate, ultimately delivering around 100 Vision Jets per year.

Assembly of the all-composite aircraft is being completed at Cirrus' Duluth manufacturing plant, with composite parts manufactured at its Grand Forks, North Dakota, facility. Owners get to meet their new jet at Cirrus' Vision Center in Knoxville, Tennessee. In addition to a customer delivery facility, the Center will also be where customers will undergo



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initial and recurrent training, as well as serve as a factory service center. Cirrus envisions the Knoxville campus to be an all-encompassing owner experience, where owners want to drop in to visit even if they don't have business there.

Flying the Vision Jet

When Cirrus contacted me about flying the Vision Jet, they wanted me to evaluate the aircraft not just by its handling characteristics and performance metrics, although that is always part of the process. Owning a Vision Jet is a lifestyle. Thus, they wanted me to experience the jet as their owners would: on a real trip. Although schedule conflicts prevented us from flying the two-day “real-world” trip they proposed, I spent a full day learning about and flying the jet on a two-hour roundtrip flight from my Kansas City home base.

On the ramp, the Vision Jet sets itself apart with its trademark V-tail “ruddervator,” which allows the single Williams FJ33-5A to exhaust between the tails. Bergwall pointed out the aircraft's yaw stability augmentation system that comprises of two small surfaces on the aft end of the strakes on the empennage. From the runway to 200 feet AGL, the surfaces automatically provide a “weak” yaw damp. After 200 feet, the yaw damp kicks in with more force.

With the engine mounted high and aft on the aircraft, one naturally wonders about awkward pitch behavior. Bergwall pointed out that the angle of the engine intake creates a bit of a visual illusion as the thrust line is aligned with the aircraft's water line as seen if you look at the exhaust cone of the aircraft. The trailing link gear is a nice feature as it is useful crosswind landings and ensures a smooth landing just about every time.

There is very little to check on the walkaround except the oil, which is accessible by a small spring-loaded door. For this 5-foot 8-inch pilot, I would need a stool to see it as it's located fairly high on the nacelle. The Cirrus Airframe Parachute System (CAPS) is enclosed in the nose of the aircraft and can be deployed at altitudes greater than 1,000 AGL. To deploy it, the pilot pulls handle and if at airspeeds greater than 135 kts. KIAS, the autopilot will engage to level the wings and slow down. The system then uses a small rocket and inflators to get the parachute up and over the tail and engine.

After the visual inspection, we were ready to launch. The clamshell door is at a slant that makes it more natural to get into the cockpit and then move the seat up for others to climb aboard. Once seated, the cockpit is dramatically uncluttered. Bergwall noted



Incorporating the Cirrus Airframe Parachute System (CAPS) into the Vision Jet was a design priority for Cirrus. The parachute can be deployed above 1,000 feet AGL.



The Vision Jet will feel familiar to SR pilots with throttle, sidestick, flaps and switches in similar locations. The Garmin Perspective integrated flight deck offers a plethora of workload-saving and safety features. The panoramic windscreen is among the best in the owner-flown turbine category.

Cirrus Vision Jet

Specifications

Base price.....	~\$2 million
Powerplants	Williams FJ33-5A 1,800 lbsf
De-ice system (wing and tail)	Pneumatic boots;
De-ice system (engine inlet)	bleed air
De-ice system (windshield)	TKS fluid
Length.....	30.7 ft
Height	10.9 ft
Wingspan	38.7 ft
Seats.....	1+5/6
Cabin width.....	5.1 ft
Cabin height	4.1 in

Weights

Empty weight	3,572 lb
Maximum ramp weight.....	6,040 lb
Maximum takeoff weight.....	6,000 lb
Useful load.....	2,499 lb
Payload w/max fuel.....	498 lb
Zero fuel weight.....	4,900 lb
Fuel capacity.....	2,000 lb

Performance

Max operating altitude	28,000 ft
High-speed cruise, FL280	300 KTAS
Range – economy cruise, FL280.....	1,200 nm
Takeoff distance	2,036 ft
Takeoff distance over 50-foot obstacle	3,192 ft
Landing distance.....	1,628 ft
Stall speed with flaps	67 KIAS
V _{le} (max gear extended)	210 KIAS
V _{fe} (max flaps extended).....	190 KIAS



With a width of 61 inches at its widest, the Vision Jet cabin is spacious with large windows.

every switch and knob had to earn its way onto the aircraft. For an SR pilot, it will feel instantly familiar: the autopilot, flap control, throttle and control stick are all in the same location. Just as remarkable is the large, unobstructed view out the windscreens, most likely the best of any turbine aircraft out there.

The Garmin Perspective integrated flight deck (based on G3000 system) features two large landscape-oriented displays (PFD and MFD) and three touch screen controllers: one main FMS controller, a second for PFD/MFD controls and a third for communications. The touch screen controllers are oriented in a landscape format, with the left one serving as a backup display, eliminating the need for separate displays.

The cabin, although somewhat spartan in its appearance, is marvelously spacious. It is 61 inches at its widest and seats up to four passengers plus two child seats. The windows are large and offer excellent views. The jet also comes with an

optional potty. Cup holders, a USB connector and headset jacks are located at each seat. You can easily imagine the cabin appealing to pilots with young families.

Starting the Vision Jet is simple: twist the start/stop button, then flip on the main generator and alternator; the FADEC takes care of the fuel for you. Speaking of fuel, the aircraft holds 296 gallons usable, or 2,000 lbs., in two wing tanks that are continuously and automatically balanced. At full fuel, you can achieve the 1,200-nm range, but you have less than 500 lbs. payload to work with. Cirrus predicts owners will most likely fly shorter legs, giving them more flexibility to carry more cabin payload.

With its castering nosewheel, taxiing the Vision Jet is a lot like the SRs: it takes some practice to master but easy to control once you start moving. The jet has low thrust at idle, so there is no requirement to ride the brakes. I loaded the flight plan to Sioux City, Iowa (KSUX) and the aircraft's performance calculator automatically provided V speeds and runway required. Once on the runway that big windscreen provided a panoramic view of the airport environment and the pavement ahead.

Applying the FJ33's 1,800 pounds of thrust yielded immediate acceleration. At 90 kts., I rotated, cleaned up the aircraft and aimed for a 155-kt climb. The side controller requires a determined pull to unstick the nose and fly off the runway. Once airborne, the aircraft is nimble and responsive

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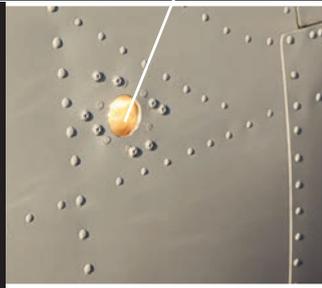
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but not twitchy. Once at our cruise altitude of FL280, power was reduced to 39 percent of thrust, yielding a 286 TAS and 66 gph fuel burn at -37 Celsius OAT.

En route, we turned on the Enhanced Vision System. Especially useful at night or in low-visibility, the infrared camera allows the pilot to spot wildlife on the runway, or to pick up the runway environment during a black-hole approach. We were able to clearly depict the Missouri River valley leading to Sioux City, as well as the town itself.

Although Sioux City natives may correct me, I have never landed at KSUX when it wasn't windy. This day didn't disappoint. We set up for the RNAV Rwy 17 approach and the FMS calculated my Vref to be 79 kts., about the same speed as an SR22. In spite of the bumpy, windy conditions, the plane was responsive and easy to slow down and keep on the centerline. Due its high-lift wing and composite structure, the Vision Jet handles turbulence firmly. SR pilots will also

love the way the Vision Jet lands: the attitude is nearly the same, and the trailing link gear makes for a smooth arrival using less than 3,000 feet of runway.

On the return trip to Kansas City, we tried out some of the safety features that will be important to single-crew operations and owner-pilots. The Garmin Electronic Stability & Protection system (ESP) will keep the jet out of the edges of the envelope when the autopilot is disengaged. If it senses a high rate of speed, it will nudge the nose up to avoid exceeding V_{mo} . It will also push the nose down in high angle-of-attack attitudes, and level the wings if bank angle becomes extreme. And like the SRs, there is a blue LVL button that engages the autopilot and brings the aircraft back to level flight. The aircraft also has a stick shaker/pusher for stall protection and an emergency descent mode if the system detects a cabin altitude that is too high. All these automated features – in addition to the CAPS – points to Cirrus' commitment to safety.

Back on the runway in KC, I reluctantly made the turn onto the first available taxiway. One word came to my mind over and over: fun. This jet is simply fun to fly.

Training & Service

New owners will be required to obtain an SF50 type rating. Cirrus has designed a transition program for its piston owners that begins six months before delivery with an evaluation flight to assess instrument skills. From there, they are given an individualized "prescription" to sharpen skills or augment experience. They are also introduced to computerized ground school courseware to begin learning systems.

The training facility, which will be fully operational in April 2018, will house one full-motion simulator and two flight training devices (with room for up to four FTDs.) Cirrus anticipates initial training will take 10 days, but offers an "accordion"-type training program that can compress or stretch depending on the customer's needs and previous experience. Owners also have the option of training in their aircraft, but are encouraged to take advantage of the sim training.

"Because of the jet's simplicity, docile characteristics and cockpit commonality to the SR22, transitioning to the Vision Jet is not a huge leap for many of customers. Most won't be required to fly with a mentor," said Bergwall.

Cirrus offers three levels of warranty programs, the highest being an all-inclusive, prepaid maintenance program that includes scheduled and unscheduled maintenance of airframe, engine and avionics. The top tier also includes annual flight training, and Cirrus indicated that several lenders are willing to finance the program. Currently, Cirrus has a company-owned service center in Knoxville and three additional ones operated by partnering companies. The company said it will continue to grow its service network as the population of Vision Jets grow.

Currently, inspection intervals are every 100 hours, with engines set at every 300 hours. The company said

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it will make in intervals longer as the aircraft matures and plans to eventually offer a phase inspection similar to other jet manufacturers.

Final Thoughts

Like with any new jet, there are a few issues to work out. One is the noise level in the all-composite aircraft. In the climb, the noise from the engine and air conditioning condenser is too loud for this level of aircraft. In cruise, it is more tolerable with noise canceling headsets, but still could be better. Cirrus said it is actively working on the issue and hopes to have a solution soon.

With the Vision Jet, Cirrus knew exactly what they were building and who they were building it for. Its established, loyal customer base loves their planes because they deliver speed, performance, comfort, safety and technology – and it does it with style. Cirrus style. The Vision Jet is an extension of that philosophy, and with 600 orders on the books (mostly current Cirrus owners), it appears they have created a winner. Thanks to the Vision Jet's 38.7-foot wingspan – the SR22 is 38 feet – owners will be able to pull their SR out of the hangar and slide in their new Vision Jet into the same footprint.

But you don't have to be a previous Cirrus disciple to covet a Vision Jet. Thanks to its simplicity, spacious cabin and fun flying characteristics, it is on its way to being a popular choice for owner-pilots, especially those moving to a turboprop for the first time. **T&T**



Below the jet's ruddervator tail is the aircraft's yaw stability augmentation system that comprises of two small surfaces on the aft end of the strakes. From the runway to 200 feet AGL, the surfaces automatically provide provides a "weak" yaw damp. After 200 feet, the yaw damp kicks in with more force.



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Becoming a Jet Pilot

Getting your first jet type rating takes work, but with the right training, it's more than attainable.

by Jacob Tyler

With more than 1,000 hours behind the controls of King Airs, I've come to know and love "the King" over the past few years. It was the first turbine-powered airplane I got my hands on – achieving my ATP in a King Air 90 simulator, my first type rating in the King Air 350 and even crossing oceans in the beloved turboprop. The King Air is like an old friend. There is a level of comfort and respect that I share with no other airplane.

With that said, imagine my inner turmoil as I walk through the door of the TRU Simulation + Training facility in Carlsbad, California to begin my initial type training in the Cessna 525 Citation Jet series.

On one hand, in a mere two weeks I will be type rated in a jet! On the other hand, I feel as though I am betraying my Beechcraft brethren by moving into a Citation. Will I forget where my roots are planted when I am flying along at FL450 cruising at well over 400 KTAS? Only time will tell. But as I step foot into the ground school classroom, I push these thoughts out as I prepare to "take a drink from the fire hose," as they say.

The Model 525

The model 525 Citation Jet (more often known as the CJ) assuredly needs no introduction to the readers of *Twin & Turbine*. The many iterations of the CJ have been a favorite of owner pilots and corporate flight departments alike for decades. Known for its reliability, performance and single-pilot simplicity, the CJ is a first stop for many aviators looking to make the jump to jets. And for good reason with its performance, pedigree and shared type rating.

While I will be flying a newer 525 model for my employer, my initial type training will be conducted in the "legacy" CJ3 (legacy referring to the Rockwell Collins Pro Line 21 avionics suite versus the latest current-production G3000). This aircraft features standard seating for 2 crew plus 8 passengers, a maximum takeoff weight of 13,870 pounds, and two FADEC controlled FJ44-3A engines each producing 2,780 pounds of thrust at takeoff.

Ground School

Being scheduled for class just a couple of weeks before the start date, I immediately receive pre-course study material from TRU. While I am accustomed to receiving pre-course study material from other training providers, I am amazed to see that TRU actually sends a link and log-in to their learning



management system (LMS), which gives the user access to all ground school slides, schematics and quizzes. This system is used by the folks at TRU to work around customer's busy and complex schedules for initial, recurrent and transition/differences training.

For my initial course, there is no requirement to have any of the LMS completed, but I want to be prepared. Based on past experience, I know that having a base line knowledge of limitations and memory items pays dividends when you show up to class.

After the normal greetings and paperwork with the training center staff, the first section we cover is the "Aircraft Overview," which covers general details and limitations about the aircraft. Following the overview, we take on each system of the aircraft slide by slide. I am fortunate to be one of just two students in the classroom so questions, clarifications and discussions with the instructors come easily. I am a true believer that when it comes to an initial ground school, you get out of it what you put in. If you are uncertain about a portion of a system, speak up. These instructors are product experts. Anytime I can challenge them, I find that my understanding benefits greatly from the exchange. (I often find myself returning to the classroom early from breaks to play "stump the chump." The more I play, the less I feel like I am the chump).

As class goes on, any trepidation I had regarding a jet being inherently more complicated than a turboprop is washed away. From preflight to shutdown, every procedure and system has been meticulously engineered with the single pilot in mind. For example, most switches have three positions in which one position is labeled "Normal." Switches in a normal position will always be in that position unless an abnormal checklist calls for a change. Simple, but genius!

Systems Training

At first glance, I think that my schedule is incorrect. On my first day, I am

scheduled for a simulator session in the afternoon. To my pleasant surprise, it's not a typo. TRU quickly gets customers into the seat of the non-motion systems trainer. The idea is to allow the pilot to immerse themselves in the systems operations while ground school is still fresh in their mind.

I am truly impressed by TRU's systems trainers. The cockpit is a CJ cockpit all the way down to the power levers and yoke, similar to the full-motion level D simulator used later. The only difference is that the systems trainer stays motionless on the floor.

By Day Five of ground school, I have already conducted a practice run on all simulator profiles that I will be flying leading up to my check ride. I enter the weekend feeling ahead of the game.

Sim Time

At the beginning of week two, I return to the training center feeling refreshed but filled with nervous excitement. Just five short simulator sessions separate me from a FAA type rating check ride.

The first simulator flight is little more than a familiarization flight with normal procedures used to build familiarity and comfort with the aircraft and simulator. I focus on my instructor's guidance during the flight maneuvers (steep turns, stalls and unusual attitudes). This is the only time built into the syllabus to practice before the mock check ride at the end of the week.

The sim flies spectacularly. It is smooth and extremely lifelike with its dazzling visual displays. As I push the power levers up and release the brakes for the first time, I am hit with the speed. This thing flies! Even with my high-performance turboprop background, I am quickly humbled by how fast things seem to happen in the CJ. The straight-wing jet has the ability to easily climb at over 4,000 fpm.

I hear the assuring voice of the instructor prescribing remedies, "Don't be afraid to use the autopilot..When you level off, you'll want to pull the power levers all the way to idle, then advance them forward only an inch... We are shooting for 55 percent power. Remember 55: Stay alive. This will be your go-to power setting."

Tips and Tricks to Ace the Ride

- 1. Take the pre-study seriously**
At a minimum, take time to internalize memory items and aircraft limitations.
- 2. Take notes**
Designate a notebook for every initial and recurrent training course. It is helpful to hand write items that you find important using your own words. In the simulator, highlight items and/or write notes in the margin of the provided checklist for reminders later.
- 3. Ask questions**
As they say, there are no dumb questions. You will be covering multiple complex systems so take the time to get clarification on something that might be confusing.
- 4. Take advantage of free time**
Arrive back in the classroom a few minutes early to review notes or ask questions. During simulator sessions, make mental notes of maneuvers or scenarios you would like to redo at the end if time allows.
- 5. Chair fly**
This is a great way to prepare for and make the most of your simulator session each day.
- 6. Learn to fly the simulator**
All simulators have their quirks. You can learn about them by either asking your simulator instructor or by simply observing them for yourself.
- 7. Verbalize**
Talk through all of your checklists and briefings. This not only benefits yourself, but also the instructor or check airman.
- 8. Use memory aids**
Pickle, pitch, power; flap, gear, flap. Any reminder such as this is a great tool to help you keep track of which steps are required and what comes next.
- 9. Don't feel rushed**
Take your time to set the airplane up for each maneuver and instrument approach. If you do not feel like you are 100 percent set up correctly, let the "controller" know and request additional time.
- 10. Be prepared**
There are few surprises when it comes to the check ride at simulator training providers. Thoroughly review the outlined flight prior to taking the check ride and commit it to memory.

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169	CITATION CJ2+
360	CITATION CJ3
63	CITATION CJ3+
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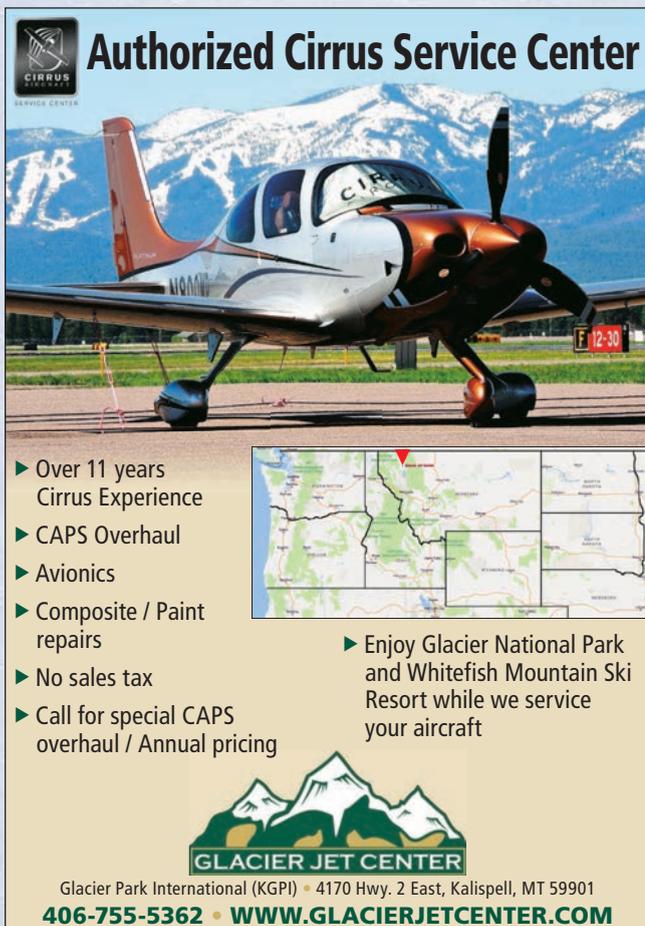


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As the session goes on, the instructor is quick to point out one of the features that has made Citations so popular for first-time jet owners: the aircraft fly exceptionally well at low airspeeds. When slowed down, the CJ is no different from the familiar turboprop, or even some high-performance pistons.

I prepare for the next few days in the same manner as the first. I reference the syllabus, chair-fly all procedures, practice flows backed up with a checklist and if time permits, I study my notes regarding systems. Following each session, I am grateful for extra allotted time to practice additional procedures recommended by the instructor.

The last day of simulator training is used as a “mock check ride.” There are no practice runs or redo’s. Throughout the three-hour session, I note maneuvers I know I can perform better. A slight altitude deviation here, an opportunity to better maintain directional control there. At the end of the session, we again have extra time to practice a few select maneuvers.

The Check Ride

The day has arrived – check ride day. It’s time to prove I have what it takes to fly a jet.

The two-hour oral test sails by smoothly. I am then briefed by my examiner about the standards for successful completion of each maneuver before leaving the briefing room. Next thing I know, I’m strapped in the left seat of the simulator.

I feel the familiar jostling of the simulator as it comes to life. As I look through the windscreen in front of me, I see we are suddenly on a foggy ramp at Memphis (KMEM).

We start the flight with a low visibility taxi to runway 18R. First, the examiner simulates an engine failure prior to V1 on takeoff. Next comes a minor electrical failure, stalls and steep turns. As I hand-fly these maneuvers, my confidence builds and I am reminded that no matter the type of airplane, it will fly like an airplane.

Unfortunately, next up is the really tough stuff: an engine failure after V1, a single-engine precision and non-precision approach and a single-engine go-around. Fortunately, I am feeling prepared. I can almost hear my instructors talking me through each procedure.

The remainder of the flight passes by as practiced. Before I know it, I am touching down for the last time on 18R at Memphis International following a hydraulic system failure causing a manual gear extension and flap-up landing. The check airman, acting as tower controller, informs me that he has noticed smoke and flames coming from my aircraft. I perform the emergency shutdown procedure and yell to my imaginary passengers to exit to safety through the main cabin door.

Now, a few months removed from the experience, I’ll never forget what came next. As the simulator assumed its parked position, the check airman looks up from his paperwork and says: “Congratulations, you’re officially a jet pilot!”

Jet pilot...I like the sound of that. 

Jacob Tyler is an ATP-rated turbine pilot, instructor and mentor. He currently flies corporate aircraft both single-pilot and as crew for a Fortune 500 company.



Unified Flying Theory

To unveil the elusive aeronautical "Theory of Everything," strive to be an artist and a technician in your flying.

by **Thomas P. Turner**

I made my traditional Christmas Eve flight with my father-in-law Jerry, a non-pilot but lifelong motor sports enthusiast. The skies were clear and cool, although hazier than I expected (maybe 20 miles flight visibility, less than normal in winter over central Kansas), and the winds were calm to the point there was no obvious preferred runway (a real rarity in Kansas). My wife's father had a blast, and I had fun too, fighting corrosion by warming up the oil (the engine's) and staving off rust (mine).

On final I called out airspeeds, alignment and glidepath to myself as I always do, pulling the power to idle, easing back on the elevator, and pressing just a little extra rudder at just the right time. The wheels rolled onto the pavement so smoothly it was hard to tell when flying ended and taxiing began. It was like easing into a pool when the water temperature is exactly the same as the air temperature – it's hard to tell you've transitioned at all.

It's not bragging if you honestly say, "that doesn't happen often," and mean it. Everything just came together. My landing reflected a lifetime of practice, of mistakes from which I learned, and the confluence of my currency, my fatigue state, the airplane, the weather and a little luck.

I hope you find yourself making this kind of landing now and then also. Getting close to this near-perfection is more common than it used to be. But it is never guaranteed. As soon as I let my currency slide, or I get tired, if the winds get whirly or I fly a different airplane (even the same make and model), and most importantly if I stop thinking I have to work hard every time to achieve it, this level of performance becomes elusive and unattainable.

So, as we were rolling out and I told Jerry "that doesn't happen often," he replied, "Well, you've got to read the wind and the machine." I do not know if I have ever put it quite this way, but his words prompted me to respond: "In the last 100 feet flying stops being science, and becomes an art."

Science and Artistry

I probably come across as a very mechanical, methodical pilot. I'm very scientific, very technical in the way I fly. But that's only part of the truth. I truly love flying airplanes well, and helping

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Sometimes everything just comes together for a textbook perfect landing, reflecting a lifetime of practice and the confluence of currency, fatigue state, the airplane, the weather and a little luck.

others fly their airplanes well, too. Although you can fly an airplane acceptably and safely "by the numbers," to fly it well you have to adapt to the variables, to detect, measure, respond to and measure your responses by feel, artistically. You must use "the numbers" as a predictable starting point - they get you maybe 85 percent of the way there - then modify your inputs to get from that solid-B report card to A-level, 90 percent or 95 percent or 98 percent flying. If it all comes together, maybe, just maybe, you'll occasionally attain that elusive 100 percent, A++ grade.

Prolific aviation columnist Michael Maya Charles is known for his "Artful Flying" philosophy. Michael says that his contacts with pilots of all types of aircraft and experience levels have caused him to "connect the dots between what great pilots do and the similar process a great basketball player like Michael Jordan might engage in, which is the very same process a cellist like Yo Yo Ma or Pablo Cassals might employ to become the amazing musician that brings tears of joy to our eyes when they play." In his book Artful Flying Michael writes:

Art is the pursuit of the possible, and requires that you be fully vested, fully engaged in what you do.

Michael asks a question:

The aviation world is flush with technicians; artists are few. Artist or technician: which do you want to be?

Putting it Together

Scientists seek a *Unified Field Theory* (a phrase coined by Albert Einstein) that expresses all the variables of energy, mass, atomic force, electromagnetic force and gravity in a single, "elegant" *field* or mathematical equation. Sometimes this elusive explanation for the entire functioning of the universe is called *The Theory of Everything*, a framework of physics that may or may not be described by a single mathematical formula.

I tend toward the technical; that last paragraph proves it. But I'm also an artist, or at least I'm trying to be. I'm looking for a *Unified Flying Theory*, an aeronautical Theory of Everything, in the way I fly. I know I won't ever get there, and if I get close it won't be for long...because the variables are always changing. But I'm working on it, all of the time.

Ask yourself if you are primarily technical in the way you fly, doing things by procedure or by the book; or if you are mainly an artist, flying by feel. Resolve to explore the "other side" to become an A-level pilot in normal operations *and* in unusual-for-you operations, and any abnormal or emergency situation you're unlucky enough to face.

If you're an Artist-Pilot, devote time to:

- Reviewing your airplane's operating handbooks or manuals;
- Incorporating use of simple checklists in all phases of flight;
- Memorizing and practicing the critical steps of emergency procedures;
- Developing a deep understanding of the aircraft's systems, their operations and how you operate them;
- Practicing the maneuvers required on the Practical Test for the pilot certificate and ratings you hold, ensuring you can still fly them at least as well as you did on the day you passed each checkride;
- Taking dual instruction on the maneuvers and standards of the next level of pilot certificate or rating above that you already hold (Commercial if you're a Private Pilot; ATP if you are instrument rated, etc.) to learn new maneuvers and adhere to a higher level of precision than you've been held to this point; and
- Flying with an instructor who specializes in your aircraft type, to learn tips and tricks for flying it predictably "by the numbers."

If you're a Technician-Pilot, design a plan for the coming year that includes:

- Adding a new flying experience, such as a tailwheel endorsement, sailplane flight, seaplane training, complex or multiengine training, or mountain flying, even if you don't plan to pursue a checkride or plan to fly that type of aircraft or operation again. Immersing yourself in a learning mode, you will invariably find something new that you can apply to the type of flying you do do;
- Taking spin training or introductory aerobatic flight, in an appropriate aircraft with a qualified instructor;
- Making a long VFR cross-country flight, if you routinely fly IFR;
- Using your technical bent to develop a deep understanding of the aircraft's systems, their operations and how you operate them;
- Developing cockpit flows to use in conjunction with checklists;
- Practicing the maneuvers required on the Practical Test for the pilot certificate and ratings you hold, ensuring you can still fly them at least as well as you did on the day you passed each checkride;
- Taking dual instruction on the maneuvers and standards of the next level of pilot certificate or rating above that you already hold (Commercial if you're a



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Are you primarily technical in the way you fly, or if you are mainly an artist, flying by feel? Resolve to explore the "other side."

Private Pilot; ATP if you are an instrument-rated pilot, etc.) to learn new maneuvers and adhere to a higher level of precision than you've been held to this point; and

- Flying with an instructor you've never flown with before, who specializes in your airplane type but who will teach you skills and techniques your usual instructor may have missed.

The goal is to become an A-level pilot by expanding beyond where you are now to where you can be, using the Unified Flying Theory or aeronautical Theory of Everything. Combining artistry and technical expertise is mastery of flight. **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.

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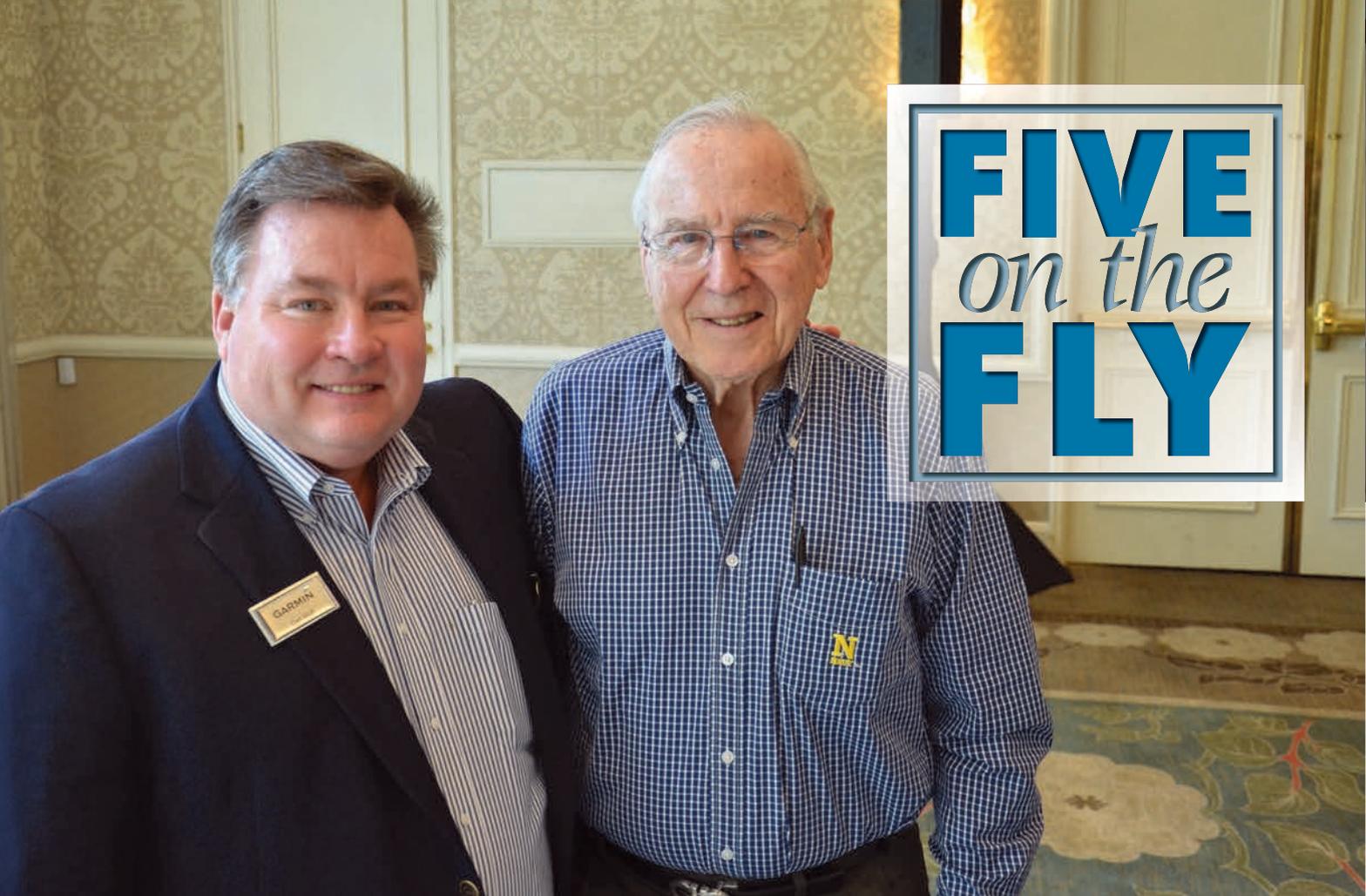
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Carl Wolf (left) with James Lovell, commander of the Apollo 13

by Rebecca Groom Jacobs

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HOURS:
5,000+

If you've worked in the business aviation industry for a few decades, chances are you know Carl Wolf. With a work ethic and energy bordering on legendary, Wolf has not only enjoyed a successful career in aviation, he truly lives it. It would be difficult to find a person with more knowledge and who emanates more enthusiasm and passion for the aviation industry than him. He has also had a hand in launching the careers of many current industry leaders.

After starting his career and working up to management roles at King Radio and AlliedSignal (now Honeywell), Wolf joined Garmin in 2002 as manager of aviation OEM sales. In this role, he led the Garmin team as the company launched its first integrated flight deck, the G1000. Since then, the company has grown to dominate not only the OEM general aviation market but the retrofit aftermarket landscape as well. He was appointed to his current role of vice president, aviation sales and marketing in October 2011.

1. *In your career, you've been on the front row to some of the biggest technological leaps in general aviation avionics. In your opinion, what developments have been the most impactful to how we fly?*

Several come to mind, but certainly the transition to area navigation systems (RNAV) is near the top of the list. With that advancement, pilots could plot their course on a Jeppesen RNAV en route chart, input the cardinal radials and distances into the RNAV system, and off they go – direct! At the time, we thought what could possibly top this? Now, the world of navigation has dramatically improved further with satellite-based navigation. I will never forget reactions to the first “space-based” approaches using zero land-based NAVAIDS. People were spellbound. Finally, database administration gets an honorable mention. Long gone are the days of floppy disks and data cards. Recently, with the proper equipment, the process can be done wirelessly with nearly no human interaction at all.



Carl flies the Cirrus Vision Jet on an evaluation flight.

2) What particular advancements in avionics technology have had the biggest impact on safety?

TCAS systems, TAWS (GPWS) and topographical mapping – all are excellent contributors to improved situational awareness and safety. Along with advanced new-generation autopilot systems using MEMS-based AHRS (as opposed to iron gyros) that include safety features such as electronic stability and protection (ESP) and emergency decent mode (EDM).

I used to joke that airborne weather radar came over on the Mayflower, but considering the number of technological advances that have driven new radar designs over the years, I would also add this product to the list, given its benefit of real-time tactical weather avoidance.

3) For the past decade (starting with the G1000), Garmin has been a dominant player in the development of integrated flight decks for new aircraft. How does Garmin keep the fire lit to continually pursue innovation and improvements?

Simply put, Garmin is strongly committed to serving our customers, both current and future, with continuously improved-upon products. This is the same culture and passion our founders instilled in the business from the beginning. For example, with regard to the G1000, entry into service occurred in July 2004, but Garmin has since implemented dozens of new features, interfaces and enhancements – nearly all of which are designed to be compatible and upgradable with the first systems delivered over 10 years ago. Synthetic Vision Technology (SVT) being one of the more notable enhancements.

4) With the improved economic outlook, general aviation is poised for growth. What happenings or trends do you envision occurring in the marketplace over the next decade?

I am feeling very optimistic for the future of our industry. Along with everyone else, Garmin was impacted during the economic downturn. However, we did not allow it to affect our ongoing investments. Judging by recent new aircraft developments and product announcements, other manufacturers also recognize the need for innovation. Trend-wise, I think we can expect new entrants into the avionics space over time (more

so on the small-airplane side). The FAA has done an amazing job in recent years in focusing on safety and the speed in which innovation can occur and be certified on certain aircraft.

5) Garmin seems to be increasing its investment of new products for the retrofit market. Why is this an important market for Garmin to focus on?

I can see why it appears that way. The past three years were incredible in terms of new products of ours reaching the finish line. But the truth is we've been working on these products for a long time! Along with forward-fit solutions in G1000, G3000 and G5000 (plus the rotorcraft derivatives) and more recently NXi, I think it gives the appearance that we're just coming back to the retrofit solutions. But we've been developing "retrofit" products all along as it is a very important market for Garmin. 

Rebecca Groom Jacobs can be contacted at rebecca@groomaviation.com.

Carl Wolf (far right) with Dick Rutan and Jeana Yeager, the duo who flew the first non-stop, non-refueled flight around the world in 1986. Wolf was instrumental in designing and equipping their aircraft Voyager with King Radio navigation equipment.





Cracked Cylinders

by Kevin Ware

What previously was a smooth, aerodynamic engine cowl is now laying on the hangar's concrete floor with various parts never intended for public viewing being exposed in all their tangled awkwardness for any passerby to see. Within this jumble of tubes, wires and other objects mounted on various odd-shaped brackets, there is a small spark plug opening, and next to that a half-inch black line from which there extends an ominous blue stain. The stain results from the fact that 100LL fuel has mixed with it a blue dye, and when it leaks out through a crack in a cylinder head, it leaves a trail of blue pigment running uncomfortably close to the nearby Mexhaust stack.



During a routine inspection, a cracked cylinder was found requiring replacement. This was the latest AOG event related to a long series of cylinder problems.

To make matters worse, Paul the mechanic says the No.1 cylinder on the opposite (right) engine also has low compression, but he has not (yet) been able to find a crack. The involved cylinders, of course, are located on the far back side of the engines and almost impossible to see unless gifted with extraordinary eyesight, a very bright light, plus a huge dental mirror, and unmatched mechanical ability. Nevertheless, in spite of this difficulty, Paul an airplane mechanic of great aptitude, had just managed to find at least the one crack during a routine exhaust inspection and oil change on my Cessna 340.

Given the possibility that there may be some carbon deposit within the cylinder on the right side that is interfering with compression, what he now wants me to do is fly the airplane for 30 minutes or so, running the right engine through peak EGT a couple of times, to see if it can be burned off. That sounds OK, until he also says I should not operate the left engine with the visibly cracked cylinder and leaking fuel at anything but very reduced power.

Luckily, a lightly loaded RSTOL C340 is quite a performer. After carefully making sure all the cowls are back in place, I taxi out for the required maintenance flight. Getting on the runway, I mentally brief myself on single-engine procedures, then gradually push the right engines throttle to the stop, while holding the left engine no more than 30 inches of MP. A bit of fiddling is needed with the rudder pedals to keep the airplane on the white line with the differential power setting, but otherwise the airplane accelerates just fine, and I shortly find myself at 5,500 feet out over the Cascades cycling the right engine, while the left is kept down to not much more than idle power.



A tell-tail black line and blue staining in an otherwise brand-new looking cylinder revealed an unfortunate conclusion: a crack in the cylinder head.

Upon my return the compression on the right engine has miraculously returned to normal. So, now the only problem is just the cracked cylinder on the left side.

In spite of this relative good news, it always seems the timing for this kind of thing is very inopportune. In three days, we were scheduled to fly to Ashland, Oregon, the town also known as the Shakespeare capital of the United States to attend a play. Once you have hotel reservations, rental cars arranged, friends invited and tickets purchased, this kind of airplane news is never welcome. Paul knows it, having apologized several times for having found the problem. But then, given events over the past several years with this particular set of RAM VII engines with ECI cylinders, Paul and his fellow mechanics have learned to be very, very careful when it comes to assessing cylinder health.

The RAM Upgrade That Wasn't

About four years ago, the RAM VI engines on my Cessna 340A arrived at TBO having been flown using the same technique by the same professional pilot crew for 1,500 hours, all without really much maintenance fanfare. With the engines having worked well through that period, and being pretty happy with the service from RAM, I decided to take the airplane to Waco, Texas and have RAM change the installation to a VII conversion, the turbochargers coolers for which are quite larger.

When it was finished, I airlined back down, had lunch in the Tex-Mex restaurant the RAM sales guys like to take customers to, then flew the airplane from Waco to Seattle. Almost right away, I could see that the RAM VII conversion did what was advertised. The CHTs were cooler, and the TAS at 220 knots at FL200 with an 18.5 gph fuel flow on the rich side of peak EGT, which was five to 10 knots faster than the prior engines with the same fuel burn. I also thought they ran a little smoother and quieter with the new Scimitar propellers. Although it was somewhat more expensive than having the existing VI series engines overhauled, I was quite happy with my decision.

For about a year those engines ran perfectly. Then the problems began. It was almost like a contagious disease. Starting at about 200 hours, the right engine developing a cracked cylinder with the typical blue stain from leaking fuel. Then over 50 to 100 hours, this malady gradually spread to a random assortment of other cylinders, including those on the opposite engine. All this was going on while the airplane was being regularly flown by myself and the same three professional pilots who had managed to get 1,500 hours out of the previous engine set without any such problems.

We were also in the middle of a Northwest winter, with short days, low IFR conditions, and trips that inevitably took us across mountainous terrain with high MEAs, and a lot of ice. A Cessna 340 flies just fine on one engine, but it will not maintain adequate cabin pressure, nor the MEA required over a lot of the western United States with one engine out. We also noticed that the effected cylinders were all made by ECI. This coincided with an active public discussion about the need for an AD on the problem. All this made us pilots feel very ill at ease, and look for reasons to fly a different airplane.

Finally, following one particularly bad nighttime IFR trip from Seattle to Spokane and back, two additional cylinders on opposite engines were discovered to be cracked, and on further investigation the cam shafts were also found to be spauled. This being the fifth and sixth cracked cylinders discovered within a 50-hour period, a conference between the Gary the shop supervisor and longstanding lead mechanics Paul and Danny led to the conclusion that even if the two newly cracked cylinders were replaced, these 200-hour RAM VII engines with ECI cylinders were simply not airworthy. So, they grounded the airplane. The other pilots were relieved, the owner (me), not so much.

New Engines, New Problems

Anytime this sort of thing happens, pilot technique is the first item brought up when discussing causation. And so, we went through the routine of defending how (we) the pilots operated the engines with RAM many times. With the airplane now grounded (AOG), something needed to be done. Their solution was to offer to sell us at a discount two newly overhauled engines they had on the shelf. But first before shipping, I needed to send a \$100,000 cash deposit directly into RAM's bank account. Given the airplane with relatively new engines from RAM was grounded, this seemed like an odd way to handle a repeat customer known for paying his bills. But they insisted this was just standard company policy.

It also seemed odd that given all the difficulty being described publicly, RAM had not already switched to a brand of cylinder not plagued with this

Replacement Cylinder Break-in Flight Procedures - One Flight Only.

- When your new cylinder is replaced, the replacement cylinder should be broken-in with the same care as you give to all the original cylinders when the engine was broken-in the first time on the engine test cell.
- The use of break-in oil and break-in procedures should be followed whether replacing one cylinder or six. Single cylinder break-in oil is available from RAM. Break-in oil should be used during the first 10 hours of operation. Turbocharged engines typically break-in sooner due to higher peak cylinder pressures. Therefore, the oil should be changed at an interval as soon as consumption stabilizes, but no later than the first break-in hour. If broken the hour, the oil should be changed by an Authorized Diamond Model Brand Oil.
- **DO NOT BREAK-IN FLIGHT IS REQUIRED.**
- There should be a replacement cylinder break-in flight based upon the following steps:
- Information presented in this maintenance tip is as performed by RAM when breaking-in a C130 T300 S30L (R750-S30) or R3 S20000 replacement engine propeller cylinders.
- The cylinder break-in flight should be performed by day VFR conditions.
- **FULL POWER SHOULD ALWAYS BE USED IN ACCORDANCE WITH THE EVENT OF AN EMERGENCY.**
- Avoid excess weight. Required One Only.
- Avoid heavy loads and environmental conditions are considered essential, and are the responsibility of the pilot in command.
- Keep initial ground run to a minimum, only long enough to verify no fuel or oil leaks prior to the break-in flight.
- Handle radio and flight plan work prior to engine start.
- Once the engine is started, remain in motion for maximum air flow through the cooling to support engine cooling.
- **DO NOT GROUND CHOLE THE PROPELLER.**
- Perform "before taxi-off" checks for safety (as practical) if landing traffic requires you to hold before taking position on the runway for taxi-off, face into the wind in the run-up area.
- **DO NOT GROUND CHOLE THE PROPELLER.** Prop cycling induces excessive pressure on the main propeller blades.
- **FULL POWER SHOULD ALWAYS BE USED AS REQUIRED IN THE EVENT OF AN EMERGENCY.**

The Replacement Cylinder Break-in Flight-First 15 Minutes & Initial Stages - One Flight Only.

- Apply power slowly and smoothly.
- Use required procedure to 20" inches for T300/S30 and full power for R3 engines.
- 1. Hold 15 minutes of operating the aircraft. (Cool RPM, speed)
- 2. 30" inches to 20" RPM. 15 minutes.
- 3. 40" inches to 20" RPM. 15 minutes.
- 4. 50" inches to 20" RPM. 15 minutes.
- 5. After first 15 minutes, cycle RPM during the cruise climb every 5 minutes between full engine RPM and cruise power RPM. Set Maximum Pressure as recommended for climb on R3 engines.
- 6. RPM remains at 20" for T300/S30 engines.
- **FULL POWER SHOULD ALWAYS BE USED AS REQUIRED IN THE EVENT OF AN EMERGENCY.**
- When appropriate altitude is reached, set air 275 (lower @ 1000'). Rich of Peak Cruise for approximately 45 minutes, cycling each every 5 minutes in increments of 100 rpm when your recommended climb rate is reached.

Replacement Cylinder Break-in Descent - One Flight Only.

- Advance prop to 2700 rpm on T300 and R3, or 1900 rpm on C130. Slowly reduce the throttle to 22" inches (Manifold Pressure on T300 S30, or 22" on C130 S30) engines and as required on R3 S20000 for descent.
- Use the mixture to maintain approximately the same EGT as demonstrated during the cruise break-in period.
- Adjust airspeed during Descent as required to maintain a 300 fpm to 500 fpm rate of descent.
- Always refer to and follow the procedures in your aircraft's Pilot Operating Handbook for all other phases of flight (e. Before Landing, After Landing, Emergency Procedures, etc.)
- **FULL POWER SHOULD ALWAYS BE USED AS REQUIRED IN THE EVENT OF AN EMERGENCY.**

Post Break-in Flight and Future Flights.

- After completing the above break-in procedures, the replacement cylinder break-in flight is finished.
- All future flights, use the break-in normal.
- Report for issues. Review the flight logs with your aircraft mechanic. Correct accordingly.

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issue. The way they saw it, the ECI cracking problem was no better or worse than cylinders from other sources. So, the new engines they planned to send up also all had ECI cylinders, albeit a new version wherein the “problem” (not admitted being present in the first place) had been fixed.



Kevin Ware's Cessna 340 parked in the maintenance hangar as it awaits a replacement cylinder.

A couple of days later, two newly overhauled engines in RAM crates were delivered to the maintenance shop. While this had been going on, the shop crew had sent out both propellers to be flushed just as a precaution. The new engines were promptly mounted and the left one performed perfectly.

The engine on the right however immediately drove the propeller into feather, a position from which it refused to budge. Finally, after doing a long checklist of mechanical tests, it was decided there must actually be something wrong with this newly overhauled engine itself, probably the oil separation ring on the front of the crank shaft.

By now the AOG period had extended to a month. RAM sent yet another engine, which was installed within a few days, and ran without problem.

We thought with the “new” and improved ECI cylinders, our problems were over, but now two years later as I was looking at the mess of parts and cowling resting on the hangar floor, with the Ashland personal trip now just three days away, I realized with restrained irritation that it was just not so. We again called our friendly RAM customer service guy, who said the engines still had some warranty coverage, but they (finally) were no longer using ECI products, and therefore he could not send us up a replacement cylinder of the same brand. They would however send up a newly overhauled one from Continental, at a prorated discount given the warranty. The cylinder was shipped to arrive the next morning, and was then promptly installed, now just a day before our scheduled Ashland trip.

I have learned to never take passengers, fly IFR or at night on a first flight after major maintenance, so I still needed to test fly the airplane. At 5 p.m. on the day before our departure, I showed up at the airport and received a “new cylinder” break-in briefing from mechanic Paul, plus a yellow and red checklist from RAM outlining what specifically needed to be done. I noticed the single most repeated line on the list was “FULL POWER SHOULD ALWAYS BE USED AS REQUIRED IN THE EVENT OF AN EMERGENCY” in all caps, something that seemed obvious to me as a pilot. Taking care to avoid any “EMERGENCY” I completed the break-in process, which basically involved cycling the power over a certain range for about an hour or so without any difficulty.

The next morning, all log entries completed, we departed in low IFR conditions to Oregon. There was a low-pressure system off the coast, producing a line of weather that extended offshore from Vancouver Island to northern California, and was working its way inland across the entire area. The left engine with its new Continental cylinder performed just fine, and we made an ILS into Medford, with a breakoff to fly VFR down the valley the few miles to the small airport at Ashland without any problem. The next day the return trip also went without a single hitch, with a nice tailwind and on top of an extensive cloud layer at FL220.

But, I am still feeling somewhat ill at ease about the remaining 11 ECI cylinders on my airplane. Just in case this happens again, I bought a spare one made by Continental.

Cracked cylinders and blue fuel stains next to hot exhaust are never a good thing. 

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 corporations 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.



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From the Flight Deck

by Kevin R. Dingman

Control Freaks

How to finesse the landing, sink the putt and regulate entropy in the universe

The phrase was first used in the 1970s, an era when the principle of “doing your own thing” and letting others do the same, was born. It's a somewhat derogatory assessment of the way in which a “driven” person interacts with their universe and the less-driven, more laid-back personalities inhabiting the same. It's often difficult for them to leave the super-efficient controlling modus operandi at the office, plant, hospital or in the plane. So, they drag it to the restaurant, social gatherings and to their homes.

These controlling men and women have an answer for everything and their precise and sterile approach to problem-solving is often seen as sanctimonious and hypocritical. I know about these sanctimonious people because I am one of them. We think we are being helpful by fixing things. The first stage of recovery from this affliction is acknowledgement of the condition.

Hello, and thank you for inviting me to this debate. My name is Kevin, and I'm a control freak.

People who are controlling often think they should correct others when they're wrong. It's important to understand that underneath the motivation to correct others is the belief that they are usually right. This is logical and easy to understand because they are right; don't argue! Controllers correct someone due to their irrational arguments; they correct grammar, sentence structure, spelling and pronunciation; they correct details of what happened in the past and they correct bad manners. They are highly principled with opinions on everything from how people should hold their fork and manage their posture to proper social interaction, politics, body art, grocery selections, career choices and clothing styles.

Some even correct the flying techniques of others; imagine that. But on the other hand, controlling is how we pilots keep track of and manage things: the weather, our fuel, aircraft systems, the payload. It's also how we decide if the mission can be completed safely, efficiently and with an appropriate level of gratification and fun.



Islands of Brilliance

It seems that being in control is the best way to get things done safely, and done right the first time. Waiting for someone else to handle it is more stressful than putting in the time and doing it ourselves because we will just have to fix it when they mess it up. It's simply more efficient to do it ourselves in the first place. We try to help others by pointing out the frustrating faux pas in their thinking, speech and gestures. And the inefficient or impractical way in which they try to complete an activity or solve a problem, like raking leaves into the wind or washing a car from the bottom-up instead of from the top-down. It's like savant syndrome (Rain Man, Dustin Hoffman, Tom Cruise 1988): we have occasional islands of brilliance in our sea of otherwise annoying, over exuberant, and often times irrational attention to detail. Just ask our spouses, family, friends, colleagues or a psychoanalyst; pilots are controlling and we can get weird about it.

Sym•me•try (*noun*) *Correct or pleasing proportion of the parts of a thing; beauty based on or characterized by such excellence of proportion.*

Do you recognize any of these traits? You arrange things in a particular, precise way. The bills in your wallet for example? Arranged by denomination, facing the same direction and all of the heads facing up.

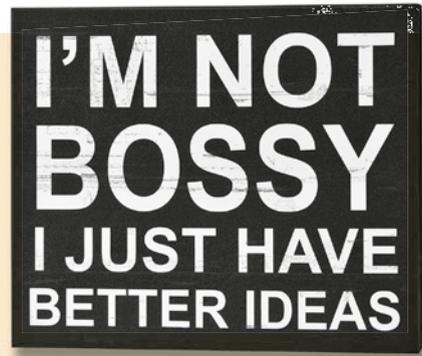
How about having things in a logical order: 8.5-by-11 in. notepads on the bottom, 3 by 4 pads next, then a tablet of sticky-notes on top. The same with incoming envelopes in the mail: legal on the bottom, then invitation size, letter size and finally postcards on top. Wall hangings must be level, symmetrically distributed and functional.

Ever contemplate why it is comforting to have a precise and predictable method for powering up the systems and starting your plane's engines, to fly an IFR routing, an instrument approach or a structured, predictable VFR traffic pattern? It's because we like things that are predictable and structured. We like precision. And we like to measure our abilities and success against rigid and reliable parameters. Unfortunately for others, we expect the same of them.

Where is this long-winded airline pilot going with his contrite but convoluted comparisons of control? While we may be admonished for our control-freak-frankness, flying an airplane is right up the middle of the control freaks' philosophical runway. Pilots control the planning, performance and precise placement of the airplane. And landing is the pinnacle of placement, precision and control. It's the glorious gem of gratification for a control freak.

Smoothness: A Golf Metaphor

A great golf stroke begins with you seeing it happen in your mind and ends when the club contacts the ball. After that, it is all a matter of physics and geometry; your control is gone. All the planning and effort that went into the point in which the club hits the ball becomes irrelevant once the ball is in motion. You can try to assert control by leaning left and right



while the ball is moving, but it will not change the trajectory. I know; I've tried it.

Landing an airplane is similar in that our descent and approach all lead up to the landing, and the landing then leads to the rollout. The amount of time and fuel saved by flying fast on approach is minimal in contrast to the hours of en route adaptation to wind, course routing, altitude selection and speed. Did you take the time to set up for the approach or did you hurry due to late descent, runway assignment or an error in programming the avionics?

How well did you transition from the descent course and vectors to final? Was the intercept at a high angle, too close to the final approach point or GS intercept? Or was it a manageable intercept a few miles outside of the marker? Flying a well-planned and stabilized approach is how we set up for a good landing, fully configured, on speed and tracking the PAPI, ILS or VNAV. Not scrambling to get the gear and flaps out as we turn, decelerate and chase the path, hoping to land in the first third of the runway.

We judge our landings, as do the passengers, by smoothness on final, the touchdown and by the rate of deceleration during roll-out. Slow down and prepare for the descent, approach and landing, as a golfer would prepare for a 15-yard, tournament-winning putt.

The Tale of Two Brains

Perhaps to temper our controlling, regimented view of, well, everything, we could relinquish a tiny bit of control. It's OK, just breathe. Pilots and control freaks are good at compartmentalization (Google search: The Tale of Two Brains). Keeping our perfection-oriented personality in its own compartment should help to shield others and create an acceptable level of restraint. We control freaks could start by leaving the summer floor mats in the car instead of changing to the winter ones and by allowing our stack of incoming mail envelopes to be sized randomly.

We may even try to tolerate bad grammar, bad drivers, clothing styles, laundry-folding techniques, dishwasher-loading philosophies, grocery choices, career moves, stupid TV shows and ... whoops, I'm having a control freak relapse. Those around us would appreciate it if we would smile more, present suggestions less often and tolerate some of the disorder in the world.

As an illustration of just how critical it is for us to allow some disorder to exist, consider the laws of thermodynamics.

The first law of thermodynamics, the one we all remember, says that energy cannot be created nor destroyed. The lesser discussed second law applies to us control freaks and says, in essence that the universe gets more and more disordered over time. It's referred to as an increase in entropy (disorder).

As control freaks, an increasing level of disorder is scary. The principle that control freaks should really fear, however, is not the second law, but the third. The lesser quoted and more obscure third law states that the entropy of a system only approaches a constant value as temperature approaches absolute zero. In our controlling mind, the disorder around us would stop, or at least stop getting worse. So, if we fix and organize everything and everyone, our control-freak universe would be at absolute zero. No disorder, no movement, no mistakes, no making a great golf shot and no making a smooth landing.

Control Freak Paradox

Despite the assertions of non-control freaks that we aren't actually in control, it's clearly the destiny of control freaks to allow an increase in entropy in the universe by not fixing everything and everyone; theoretically keeping the temperature above absolute zero. By tolerating imperfections in others, we acknowledge that they can't all be like us.

But we can still unleash our own control freak and take control of the arrival, approach and landing. Let's not allow the airplane to run out of gas or ruin the landing as



Your influence on the golf ball ends once the club strikes it. You can try to assert control by leaning left and right while the ball is moving, but it will not change the trajectory despite our best efforts.

we yield to the third law of thermodynamics. After all, imperfection and perfection are a control freak's entropic paradox and we must be cautious to not upset the delicate balance of the universe. **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.

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En Route

MightySat Fingertip Oximeter Touts Medical Grade Technology

Masimo, maker of pulse oximeters for hospital settings, has introduced its first consumer version of its technology. Intended for use in aviation and sports settings, the portable MightySat uses the same hospital-grade technology to provide a number of health parameters. As part of a pilot's flight bag, the MightySat can be a useful tool for checking and anticipating situations that might lead to hypoxia or other serious health conditions.

The device measures oxygen saturation (the percentage of arterial blood that is bound with oxygen) and pulse rate (the number of times the heart beats per minute), which provide an indication of lung and heart efficiency. The device also measures respiration rate, perfusion index (strength of blood flow to indicated changes in blood

circulation) and Pleth Variability Index (PVi) which tracks variations in the perfusion index over your breathing cycle. This may indicate changes in hydration, breathing effort and other factors.

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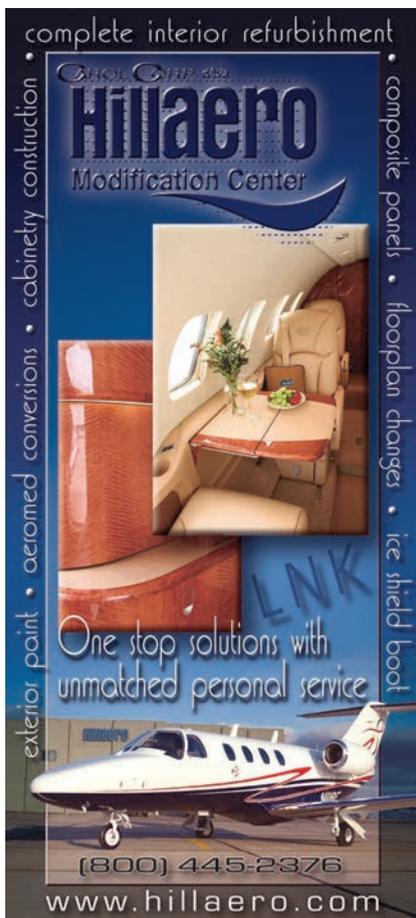
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More or Less

A few weeks ago, Patty and I were driving down the road. She reached over, gave me a big hug, and said "I love you just the way you are. More or less."

As I thought about her comment, I realized I had room for improvement. The same can be said about my flying skills. Many owner-pilots fly 100-150 hours per year. Some even less. It's hard to keep up our "A game," especially if we go four weeks without a trip. Commanding a high-performance twin or jet is definitely not like riding a bicycle. And although we can safely operate our aircraft, we have all experienced the feeling of being "behind" the airplane after an extended layoff.

The same can be said for our level of training. When we complete a training event, we have satisfied the MINIMUM standards. Just for fun, the next time you fly your loved ones to their favorite spot, turn around in the cockpit and announce, "I just passed my minimum standards test."

I cringe when I hear pilots asking others where to find the easiest or shortest training available. It is possible and legal to get a jet type rating in five days. It is also possible and legal

to do an initial type rating in 15 days. Which one you chose says more about you than the training. "I just don't have time to take two weeks from my business." Or, "My family would never let me leave for that many days."

Really?

Each of us has some method to maintain our skills. I brush off some of the rust by training more often. Every six months, I do a 61.58 check in a Part 142 full-motion simulator. Since I am currently flying both a Mustang and an M2, I do two check rides, one for each. I also take a mentor along on a trip or two each year. Yes, that's a lot of training, but it works for me. Some of us, however, need more options.

For Citation pilots, a plan is now available.

Recently, the Citation Jet Pilots Safety and Education Foundation was created to promote and support safety among our 800 members. One of our first efforts was to create the CJP Gold Standard Safety Award presented annually to any Citation pilot who meets or exceeds training standards. Our goal in creating the award is to raise the level and quantity of training our members receive. To raise the bar for all.

Some of the criteria for the award include:

- Minimum of 100 hours of PIC annually;
- At least one 61.58 check in a Part 142 simulator;
- At least six hours of additional flight training in a simulator or airplane.

Also, our award recipients must complete one item from a list of additional training, such as adding an endorsement or rating, upset training, physiology training, survival training, aerobatic training etc. Our first awards will be presented at the Citation Jet Pilots annual convention in October.

By raising the standards and rewarding those who excel, the Foundation hopes to improve safety and perhaps save lives.

Certainly, we are owner-pilots and not professional pilots. But we can still aspire to fly like the pros. Perhaps someday you will not hear, "I am a doctor or lawyer or entrepreneur, and I fly a jet."

Instead, "I am an aspiring professional pilot. In my spare time, I save lives, or practice law, or run a business."

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.

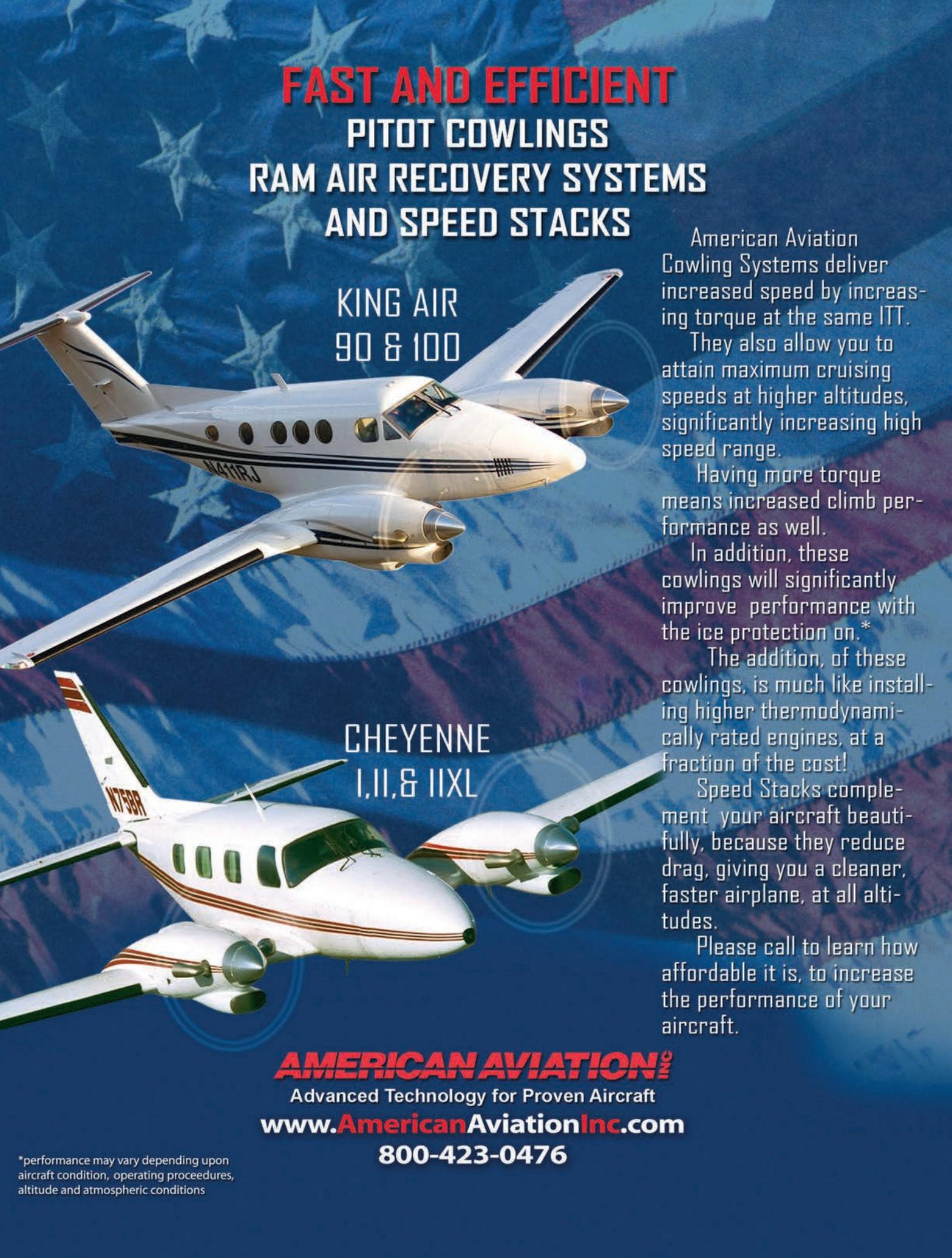
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