Understanding SAF / Flying the Piper Meridian / Owner's Corner: Eclipse 500

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Editor's Briefing

by **Lance Phillips**

Oshkosh Review

The editor's briefing in Twin & Turbine's August 2023 issue focused on the history of EAA's AirVenture in Oshkosh, WI. Since the content for that issue had to go to press prior to the event, I thought I would recap what I saw in Oshkosh here. There was a lot of new information, especially for us purveyors of speedy twins and turbine-powered machines.

Right out of the gate, McCauley Propeller Systems, a Textron Aviation company, announced certification on its new C780 four-blade propeller system for the Beechcraft King Air B300 series. For operators, the new props save weight, increase performance and make the plane quieter. McCauley is also celebrating 85 years since it was founded in 1938.

It was pretty hot during AirVenture, too, so Textron Aviation's next announcement was a welcome one for many King Air 260 and 360 buyers. Beginning in 2024, all new King Air aircraft will be equipped with Lee Aerospace's new CoolView windows. The CoolView windows feature a frost pane with an integrated window tint. This advanced design enhances visibility while reducing unwanted sunlight and glare, creating a pleasant and visually appealing cabin atmosphere for passengers and crew. The frost pane also helps reduce or eliminate unwanted ice buildup during long flights.

But wait, that wasn't all the news out of our favorite Wichita airplane maker. The ~~Cessna~~ Beechcraft Denali (yes, the United States has mountains, too) made its aviation show debut. Lannie O'Bannion, senior vice president of sales and flight operations, said, "Beechcraft turboprops are renowned for their versatility and reliability, and I'm thrilled to unveil the newest member of the legendary product family to the world."

Industry Insights, farther back in this issue, focuses on some of the updates out of Vero Beach, Florida, Piper's home base. I won't spoil the fun here, but you'll read about some M600 upgrades that will enhance ownership.

Closer to home, we had some updates from the Malibu M-Class Owners and Pilots Association (MMOPA) announcing a rebranding to the Piper M-Class Owners and Pilots Association (PMOPA). Founded in 1998, the association is a not-for-profit organization dedicated to the interests and safety of owners and pilots worldwide who fly PA-46 derivative (Malibu, Mirage, Meridian, M-Class, JetPROP and Matrix) aircraft serving over 1,300 members.

"We have taken great leaps in the last year in growing and expanding the influence of the association, and including the manufacturer in our name was the logical next step," said John Granmayeh, PMOPA President of the Board of Directors. "Piper Aircraft is the remarkable company responsible for creating the airplanes our members love flying. Mike Nichols, CAM, CAE, and chief executive officer of PMOPA, agreed, saying, "Our members are passionate about the aircraft they fly and are loyal to the Piper brand, which has a rich and storied history

and represents safety, efficiency, and excellence. These qualities align with our Association's values of Safety, Advocacy, and Community." Ron Gunnarson, Piper Aircraft's vice president of sales, marketing and customer service, emphasized the strength of the relationship between PMOPA, its members, and Piper Aircraft. "Every Piper PA-46, from the first Malibu in 1983 to the latest M600 SLS that rolled out of our paint shop this week, is part of the M-Class family of aircraft. We are excited about PMOPA's rebranding and the strength of our relationship with PMOPA and its members."

Daher brought its "Family Values" campaign to aviation fans by displaying the Kodiak 100, Kodiak 900, and TBM 960 lineup, all with new Hartzell 5-blade propellers.

Daher's dedication to backcountry operators, a large contingent of Kodiak flyers, was evident, as well. During EAA AirVenture, Daher highlighted the company's support for the Recreational Aviation Foundation (RAF) – a non-profit organization whose mission is to preserve "backcountry" strips across the United States (see T &T February 2023 cover story). As part of this support, Daher assisted RAF by providing a Kodiak aircraft and volunteer pilots to carry U.S. Forest Service personnel, along with building and support materials, to two of this federal agency's grass strips in the mountains of southeastern Idaho.

Daher also announced the 80th delivery of a TBM 960, marking the latest achievement for this top-of-the-line member in the company's turboprop-powered aircraft product line. The milestone TBM 960 was provided to a private owner, and the delivery comes just over a year after Daher formally launched the aircraft version in April 2022. The TBM 960 marks Daher's fifth evolution of its TBM 900-series aircraft family – with a combined total of 488 aircraft to date in the TBM 900, TBM 910, TBM 930, TBM 940 and TBM 960 versions. This surpasses the delivery totals for the two previous-generation TBM aircraft types, with 324 TBM 700s and 338 TBM 850s provided to customers during their production runs.

If there is one commonality to all of the brands' announcements, it might be another brand, Garmin. Our friends in Olathe, Kansas, had a few announcements, too. Garmin announced that PlaneSync is now available for retrofit installations, simplifying the lives of aircraft owners and operators.

- Using a 4G LTE cellular or Wi-Fi connection provided by the new GDL 60 datalink, PlaneSync technology enables impressive avionics connectivity capabilities to streamline an aircraft owner's pre-flight and post-flight activities.
- Eliminating the time-consuming process of updating databases via PC and data card, PlaneSync technology automatically downloads databases to the aircraft.
- Added capability coming in early 2024, PlaneSync will automatically transmit engine and flight log data to secure cloud storage after landing.
- Remote aircraft status allows aircraft owners to view the current status of the aircraft and its systems via the Garmin Pilot app or their D2 Mach 1 smartwatch.
- PlaneSync is compatible with popular Garmin avionics such as GTN Xi series navigators, TXi series flight displays, and GI 275 electronic flight instruments.

As you can see, it was an exciting time in Oshkosh, in July. NBAA is right around the corner, so we'll be there to capture more news from our favorite manufacturers.

In this issue of Twin & Turbine, we hear from an operator of Piper's Meridian and then get an in-depth report on the state of the market for Piper's trainers and M-class aircraft.

There was quite a bit of news at Oshkosh around sustainable fuels (SAF), so T&T's writer, Tigre Pickett, was on hand to demystify some of the things we have heard so far. Tigre gives an overview of worldwide SAF research and production and then sits down for a Q&A on the future of SAF.

In this month's Editor's Pics section, I provide a few photos from around AirVenture taken on my old Pentax 67 medium format camera. The Pentax 67 is big and heavy but the images it makes are pretty special.

Owner's Corner focuses on operating the Eclipse 500. And a new column, Mastering Flight, dives into recency of experience and what it means to really be proficient. Finally, David Miller describes how a little wine and some over-the-counter remedies can ruin an otherwise pleasant evening.

Thank you so much for reading.

lance@twinandturbine.com

Flying the Meridian

Sam Remcho has climbed through several levels of aviation. As he explained, he first started flying as a child with his dad, although Sam did not pursue aviation until his early twenties.

After deciding that he wanted to learn to fly, Remcho casually pursued the goal for nearly ten years. It wasn't until after he moved to Idaho from his longtime home of California that his training began to take flight. He received his private pilot's license in 2009 and his instrument rating only five months later.

He has since ascended from learning to fly and renting planes to owning aircraft. Owning an airplane has been a whole new level of aviation, he explained.

"In 2014, I struck a deal with the owner of a 2007 G1000-equipped Cessna T182T. I made a deal with him to lease the aircraft with the option to purchase it later. Then after a year, I was able to buy it. Purchasing opens a whole new world of freedom in aviation because now you more or less operate the aircraft at your whim. I was no longer restricted to being part of a club and bringing the airplane back by a certain day. And I didn't have to worry about other people flying it. That aircraft purchase is what really opened up the world of aviation for me, as well as the [western half of the United States]."

The high elevation of his geographical operating area demonstrated to Remcho a few limitations of the aircraft. One trip, in particular, prompted him to move up into turbine ownership.

Sam Remcho in the cockpit of his 2001 Meridian, which he acquired in 2021.

"I flew about a thousand hours in the Turbo 182. In 2021, I was flying out to Aspen for a meeting. I was up at 17,500 [feet] with cannulas in. It was a long flight, and I was getting beat up with headwinds and turbulence while trying to stay clear of the clouds, which had icing potential. I landed at Aspen, exhausted, before going into my meeting. That was no way to do business. It was not a way to operate efficiently and stay sharp."

"That night, I went on Controller, and the second plane I saw was [N]62LT, which I own today!" Remcho enthusiastically reported.

This move came quicker than anticipated, besting his planned ownership timeline by at least a decade. But he had long dreamed of getting into turbine ownership, and it was the opportune time to do so, he recalled.

"I had not seen the plane before making a deal on it. When I first laid my eyes on this Meridian, it was amazing. It was a dream come true, as I had always dreamed of owning a turbine and flying up in the flight levels with de-icing equipment and pressurization. I always knew that was the next level of aviation that I wanted to get to. And I had a picture of a Pilatus PC-12 on my desk since 2010, so that was always my motivation in work and business."

Remcho reported that the PA-46-500TP is the perfect aircraft for his mission, predominantly covering the western half of the United States.

Remcho flies out of Mariposa-Yosemite Airport (KMPI) in Mariposa, California.

The panel of Remcho's Meridian, complete with the logo of his ranch.

The Turbo 182T that Remcho recently sold sitting next to his Meridian in Hayward.

"The Meridian has opened up the country for me, and I use it primarily for real estate. I focus my business efforts, multi-family investment and development around the airplane because I can get wherever quickly and on short notice. My primary flights are between the Bay Area, Seattle, Portland and Denver. Sometimes I fly as far as Texas and Florida. I also use the aircraft personally to enjoy the high-country mountains of Idaho, which also often has a business component."

When not flying, Remcho loves being in the mountains, both as a volunteer firefighter and as a caretaker of his ranch property in eastern central California.

"I am based out of the Mariposa-Yosemite Airport (KMPI), which has a 3,300-foot paved runway at a 2,200-foot elevation. The Meridian operates great from that runway. Usually, it's just me and a friend or business partner or two in the airplane. But a lot of times, it's just me flying around, and I can throw all of my gear in it, whether it's a mountain bike, snowboard, or anything else," he stated. "On a 100-degree day, with tanks topped off and at full payload, I can be off the ground within 2,500 feet. I put 20 degrees of flaps in, taxi to the edge of the runway, turn onto the centerline, hold the brakes, and bring up power to about 1900 RPM. Then I release the brakes, keep increasing the power as I start rolling, set 1,250 lb/ft of torque, and use a little back pressure to take some weight off the nose wheel as I roll down the runway. Once at 85 knots - rotate. Pitch up. Clean up. Clear obstacles at 95 knots, settle in at 110 knots to gain altitude, and configure for cruise climb at 135 knots."

Once airborne, the Meridian continues to impress. Coming from an unpressurized piston, Sam is extremely pleased with the turboprop's pressurization system.

"Typically, I'll get up to about ten thousand feet while climbing at 1,500 feet per minute. Then the plane settles off at a climb rate of about 1,300 feet per minute from 10,000 feet up to FL270 or 280. Usually, I'll go up to those altitudes on the longer flights, and the cabin pressure is around 10,000 feet or so."

"The pressurization system is a breeze. The controller on the lower left side of the panel, above the pilot's left knee, is used to set pressurization. Set the dial to 500 feet above your desired altitude, and the system pressurizes the aircraft. So, if cleared to climb up to FL280, set the dial to 28,500 feet, and the aircraft pressurizes accordingly. On descent, you can step down the pressurization accordingly, so if descending to 16,000 feet, set the dial at 16,500. And then once below about 12,000 feet, I set the dial to 500 feet above my destination airport."

On the ground at KMPI.

"At [FL]280, I'll be doing 260 knots, true, and fuel burn up there is around 34 gallons an hour when it's negative 26. That is about 230 pounds an hour. That's pretty sweet, so I like getting up high. For what this plane can do, it is one of the most efficient and economical options in the market. With full tanks and payload, I can fly about 800 nautical miles and still have about an hour of flight time remaining for reserves. From my home field, it is a little over two hours to Portland, two and a half hours to Seattle and almost three hours to Denver. Time en route depends on winds, but the Meridian can typically do these trips nonstop with comfortable reserves."

There are many ways to think about stepping up into a turboprop or other aircraft.

"I can advise from two different perspectives. From a flying standpoint, if you are enthusiastic and dedicated, don't limit yourself based on perceived ability. Many people think, 'That's a lot of airplane,' or 'Gosh, how am I ever going to learn to fly that?' But I think that if you want it, if you do the right training, stay within your limits, and take the new challenge in stride, then you will do great. Do not be intimidated by the training required to fly this airplane," Remcho optimistically advised.

"From a financial standpoint, I would say run the numbers. If you are going to use the plane and it makes sense financially, then go for it. That may be more my mindset than some other folks have, but I also considered that I would be going about a hundred knots faster than in the Turbo 182. You are gaining substantial speed, and the fuel burn is comparable. I was burning 18 gallons an hour in the 182, and now at altitude, I am burning 34 gallons. So, it is not that far off, and you open up your capability to do missions that otherwise would not have been there. And the safety factor is huge since you have de-ice equipment, you can fly above a lot of weather, and you are more comfortable with a pressurized cabin."

Remcho concluded, "I am very happy that I made a substantial jump in capability, as opposed to getting a Mooney or a Turbo Cirrus or something else in that category with more airspeed. I am thankful that I could make the jump the way I did."

"The Meridian is the perfect airplane for me and my missions. I love the western US, and this aircraft can take me just about everywhere I need to go without needing a fuel stop. It allows me to enjoy the comforts of a pressurized cabin and the safety of de-ice equipment, modern avionics, and a turbine engine."

You can follow Remcho's Meridian journey on Instagram **@samremcho.**

Ron Gunnarson of Piper Aircraft

M600 SLS

Between 2010 and 2016, I worked with an industry veteran in aviation operations, marketing and sales. He and I shared a common wall adjoining our offices in a unique building constructed after Raytheon had acquired Beechcraft in the 1980s.

By the time Ron Gunnarson and I occupied those adjacent second-floor offices, Raytheon had sold Beech to private equity in 2006, calling the new company Hawker Beechcraft Corporation. Hawker Beechcraft brought me in to help ensure customer needs were front and center throughout its jet aircraft development, certification and production phases. The goal was to help facilitate communication between engineering, production, aftermarket support, sales and the end users.

Jet production stopped eventually, so we narrowed the company name to Beechcraft (dropping the Hawker). Textron, Cessna's owner, showed genuine interest in its long-time competitor. Following Beech's acquisition by Textron, Ron went on to lead Piper's sales and marketing group in Florida, and I followed suit a couple of years later, going south to Mooney Aircraft in Texas.

Ron's tenure at Piper as VP of sales, marketing and customer support has seen the brand lead the industry in innovative new technologies, new aircraft models, and new ways owners can do more with their equipment. EAA AirVenture 2023 brought some exciting announcements for Piper, and afterward, I had the chance to catch up with my former boss and friend to learn more.

Lance Phillips: First of all, Ron, congratulations on all the positive stories coming out of Vero Beach. Since you transitioned to Piper, the good news has been nonstop.

Ron Gunnarson: Thank you. It's a good time from a market perspective for the industry, and Piper has set itself up to take advantage of the environment based on strategic investments and positioning.

M600 SLS dashboard with HALO and Autoland

LP: That's great. Q2 revenues are up around 19%. Where are you seeing the most lift from Piper's lineup?

RG: Q2 is an acceleration point for Piper. While some areas of our supply base remain difficult, the labor challenges everyone in the industry has experienced are easing, and we see Q2 as the first acceleration point for production. Our aircraft are all retail sold. For Piper, comparing Q2 2022 to Q2 2023 shows:

- M-Class deliveries increased 50% from 8 to 12
- Trainer deliveries increased by around 20% from 34 to 41

There is continued demand in both of our primary markets, and we plan to deliver somewhere between 270 and 275 aircraft in 2023, all of which are already retail-sold.

LP: Piper recently announced MEL (minimum equipment list) approval for the M600. How does that apply to helping your customers?

RG: The MEL approval for the 260 M600s already operating worldwide allows those operators to put their aircraft on charter certificates, adding an extra revenue stream for those assets. We won't see an influx of orders because of the MEL approval, but it will be an incremental benefit to ownership, which will reflect in sales down the road.

LP: How about the unimproved field performance for the M600? Who benefits from this certification, and how did you get there?

RG: Piper began testing for unimproved field performance for the M600 three years ago, mirroring our investment in the Meridian and M500 programs. We redesigned the nose gear fork to accommodate higher loads. That's a significant investment in engineering resources, time and testing. The demand comes from Europe and Latin America, Brazil particularly. For these markets, we have seen a direct increase in orders because of the added capability, and also, current customer satisfaction increases because the installed base is retrofittable.

LP: HALO was a significant accomplishment for Piper in 2021. HALO seems to provide the best way to overcome challenges from competitive parachutes. Can you pinpoint and attribute incremental sales directly to HALO, especially as Piper was the first OEM to implement it on its aircraft?

RG: There is a direct correlation between M600 SLS sales increases and HALO. We have seen continuous overall market improvement since HALO's implementation, which provides overall lift, but HALO is undoubtedly attributable to the improvement as well. It's more evident if you take a step back and look at M600 delivery improvements between 2021 and 2022. In 2021, we showed +3 M600s delivered; in 2022, we improved with another +3 deliveries. Now, this year, Piper will deliver +7 M600s over 2022. The overall economy combined with HALO and the Autoland system all have a direct positive impact on deliveries.

Piper was the first OEM to go all-in with Garmin on HALO and, subsequently, the first to certify it on the M600. Piper also insisted that HALO be standard equipment as a testament to our dedication to customer safety.

The level of comfort the HALO system provides non-flying family members is tremendous. Having flown many automated landings now, seeing how the system displays its position and communicates with the non-flying passengers is remarkable. It calmly and intuitively provides passengers with distance and time-to-destination information while navigating around weather and terrain and communicating with ATC via transponder and VHF radio.

LP: I love it. Let's switch gears. You mentioned how labor markets are improving somewhat. Piper implemented the Ambassador Program recently. I see that program potentially going further and helping others in the industry, too. Do you see that?

RG: The Ambassador Program with our larger flight schools provides a connection to the Piper factory. Every year, we have three or four summer interns who have the opportunity after graduation to become Piper employees. The partnership provides

Pilot 100i

avenues to students' growth and gives Piper a strong funnel of enthusiastic employees. And it even strengthens our collaboration with Piper's dealer network. I know three individuals who started as Ambassadors, became interns, worked for Piper as employees and then transitioned to sales for our dealer network. I see it as benefitting the industry. We are also discussing with maintenance training schools how to incorporate those interested in technician roles as Ambassadors.

LP: The Pilot 100 training platform is a home run. Sales are off the charts. How did the Pilot 100 come about, and what are you seeing for the future in training? Has it helped revenue numbers and earnings? And finally, how does the Seminole, a fantastic twin trainer, fall into your business plan?

RG: There's a lot in that question. The Pilot came about as an opportunity to build a real-world training aircraft that can handle the rigors of 1,000 training hours per year at a lower price point. Most OEMs have tried to answer the question, "Where can we shed some cost to fit a particular price point and meet specific mission requirements while maintaining the brand?" The Pilot 100 answered that question for us. Quality training aircraft, used or new, are getting harder and harder to find. Hence, Piper had the opportunity to take the PA-28, arguably the best training platform in the industry, and take some things out while adding new technologies, lowering the price point and improving access to a proven airframe. With quality used aircraft becoming unavailable and light sport aircraft unable to handle the rigors of flight training, Piper launched the Pilot 100 to huge success. We have a backlog that stretches into 2026, and it's a perfect fit for our lineup, including the 100i, the Archer TX, DX and Seminole.


Ron Gunnarson,
Piper VP of Sales, Marketing
& Customer Support

When it comes to the Seminole, demand also goes out into 2026. Viable multi-engine training aircraft, like the single-engine trainers, are getting very hard to source. Piper is ramping up production to meet demand for it. Some flight schools are experimenting with alternatives, but they're finding it difficult to compete with a platform like the Seminole that has proven to handle the rigors of training 800 to 1,000 hours per year over decades. The flying characteristics of the Seminole, along with its counter-rotating props, wide cabin, and G1000 NXi avionics, make it highly competitive. Flight schools look for availability and maintainability, which affect direct operating costs. Along with the Seminole's class-leading flying characteristics, it answers all the questions for a flight school.

The training segment is strong, sales are improving, and production is increasing to meet demand. And we see the market improvement as sustainable. Training aircraft retirements are growing, and the airlines are doing their best to push people to personal aviation, which means more training aircraft are needed. We see a solid, sustainable market for training aircraft. Piper's robust support structure and parts distribution network also give our entire aircraft lineup a substantial competitive advantage. In context to the Seminole, it's almost unfair for our competition.

LP: That's all great news, Ron. Thanks for spending the time with me. T&T

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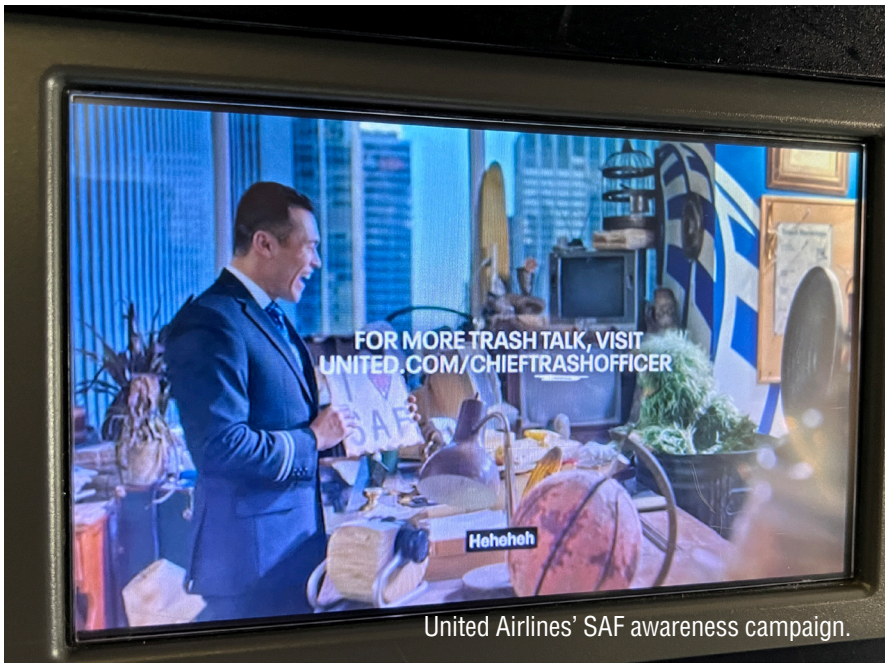
Sustainable Aviation Fuels:
Paving the Path to Green Skies

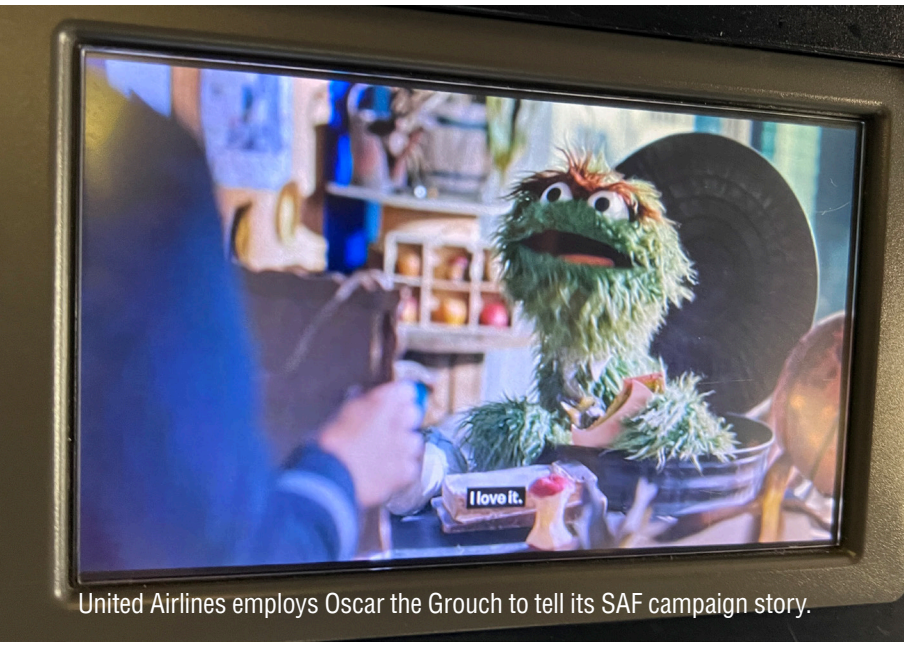
by **Tigre Pickett**

Amidst the backdrop of a rapidly changing climate — characterized by unprecedented events such as the hottest July on record, soaring ocean and land temperatures, climate activists vandalizing private jets, and airports facing reduced operations or complete termination — the aviation industry's pursuit of Sustainable Aviation Fuels (SAF) has undeniably intensified.

At EAA's AirVenture this year, sustainability was a major focus for prominent companies like Boeing, Textron, and others. AeroShell made significant strides by promoting SAF through its recent decarbonization and SAF marketing initiatives. Additionally, United Airlines effectively leverages beloved icons like Sesame Street's Oscar the Grouch to reinforce its commitment to SAF and sustainability.



United Airlines' SAF awareness campaign.



United Airlines employs Oscar the Grouch to tell its SAF campaign story.

These collective efforts are crucial, and we can applaud them. However, the aviation sector still faces critical challenges in meeting the International Air Transport Association's (IATA) ambitious targets for carbon reduction by 2030 and achieving net-zero emissions by 2050. Continuous investment, research, transparent policies, and financial incentives for SAF production and distribution are imperative to overcome these challenges.

In 2022, IATA estimates that the global production of SAF ranged between 300 and 450 million gallons, amounting to a mere 0.4% of all jet fuel consumed annually. As SAF holds the utmost importance in achieving IATA's targets compared to other decarbonization efforts, including efficiency improvements or market-based measures, producers are relentlessly working to find the optimal balance between feedstock sourcing, technology advancements, efficient distribution, and economic viability.

International SAF Regulations, Production and Availability

The aviation industry is undergoing significant changes driven by the EU's recent ReFuelEU Aviation rules. These regulations mandate fuel suppliers to provide 10% SAF by volume for all Jet A fuel sold in the EU by 2030, with ambitious plans to increase this to 70% by 2050. To further promote SAF usage and reduce emissions, operators departing from EU airports will face restrictions on tankering fuel. These restrictions prevent operators from carrying excess fuel weight, which contributes to increased emissions. Some operators also see tankering as a way to avoid purchasing SAF in the first place.

Leading the charge to meet the EU mandates are SAF pioneers such as Neste (Finland), TotalEnergies (France), Eni (Italy), and Preem (Sweden). Neste's renewable fuel facility in Singapore has significantly expanded its SAF production, securing its position as the world's largest SAF producer, producing 330 million gallons annually. With three projects in the pipeline, Neste aims to reach an impressive production capacity of 727 million gallons by 2026.

In addition to the mainstream SAF production techniques, which involve utilizing cooking oil waste or woody biomass, Neste and TotalEnergies are exploring eFuels production. eFuels promise to reduce further total greenhouse gas emissions associated with SAF.

Major EU airports have embraced SAF and are actively offering it to airlines. Travelers can find SAF in use at airports such as Amsterdam Airport Schiphol (AMS), London Heathrow Airport (LHR), Paris-Charles de Gaulle Airport (CDG), and Frankfurt Airport (FRA).

Across Asia, SAF adoption is also gaining momentum. Key airports providing SAF include Singapore Changi Airport (SIN), Tokyo Haneda Airport (HND), and Hong Kong International Airport (HKG). The interactive map supplied by 4AIR (*https://4air.aero/saf-map)* is a valuable resource for pilots seeking SAF availability at various airports.

Cathay Pacific, Hong Kong's premier carrier, has taken significant steps towards SAF adoption. In June, the airline expanded its usage of SAF by testing it in its 747 cargo aircraft. Cathay fueled four 747s with a blend of Jet A and SAF during flights from Hong Kong International to Peng International via Singapore. The company aims to use 10% SAF for its entire fleet by 2030.

SAF Production and Availability in the United States

SAF production is steadily growing domestically, with companies like Fulcrum BioEnergy, World Energy, Calumet's Montana Renewables, and Red Rock Biofuels collectively producing approximately 40 million gallons per month. While this is a significant step forward, it still represents only a fraction of the 4.6 billion gallons of Jet A produced domestically each month.

The emergence of eFuel or Power-to-Liquid (PtL) holds promise. PtL is employed by companies like Air Company, which produces drop-in aviation fuel by scavenging CO2 waste streams and combining the fuel with hydrogen extracted from water via electrolysis. However, one of the primary challenges in scaling eFuels is the substantial demand for sustainably sourced and produced electricity, ensuring efficiency and reduced greenhouse gas emissions.

Several large airports currently offer SAF, including Los Angeles International Airport (LAX), San Francisco International Airport (SFO), Dallas/Fort Worth International Airport (DFW), and Orlando International Airport (MCO). Travelers can refer to 4AIR's SAF map to find additional airports serving SAF.

While the adoption of SAF is in its early stages due to limited availability and higher costs (typically $2 per gallon higher than conventional jet fuel, depending on the feedstock, time of year, and demand), there is a positive trend. Notably, United Airlines, an early adopter of SAF, is on track to triple its 2022 SAF volumes this year. United Airlines is also actively encouraging customer participation in sustainability efforts by offering them the option to contribute $3.50 to their Sustainable Flight Fund, which invests in developing innovative technologies to accelerate SAF production.

This year, JetBlue and Alaska Airlines have joined forces with Shell Aviation to procure lower lifecycle carbon SAF. Each airline plans to use up to 10 million gallons of blended SAF at LAX, further promoting the use of sustainable aviation fuel in the industry. In partnership with Neste, Bell Textron flew a Bell 505 to become the world's first single-engine helicopter to fly on 100% SAF.

Neste also uses existing infrastructure to move SAF in pipelines traditionally used for fossil fuels. In June, a batch of SAF was pumped from Texas to LGA New York using the Colonial Pipeline.

USA's Sustainable Aviation Fuel Grand Challenge

The US Government has created a SAF Grand Challenge with a Memorandum of Understanding to reduce the costs,

What is Sustainable Aviation Fuel (SAF)?

Sustainable aviation fuel (SAF) represents a promising alternative for commercial aviation, capable of reducing CO2 emissions by up to 80% compared to traditional fossil fuels. SAF comes from various eco-friendly feedstocks, including waste fats, oils, and greases, municipal solid waste, agricultural and forestry residues, and non-food crops cultivated on marginal land. Additionally, synthetic production processes can capture carbon directly from the air to create SAF.

To meet SAF criteria, the fuel must contain a minimum of 50% SAF by volume, with some European countries setting even higher requirements. The greater the SAF ratio in the fuel blend, the more significant the reduction in greenhouse gas emissions and other pollutants, with studies showing an impressive 80% decrease when using 100% SAF.

SAF stands out as "sustainable" due to its feedstock's nature, which ensures they do not compete with food crops or necessitate additional resources like water or land clearing. Moreover, SAF production avoids environmental concerns such as deforestation, soil degradation, and biodiversity loss.

A notable advantage of SAF over fossil fuels is that it recycles CO2 previously absorbed by the biomass used in the feedstock during its life cycle. This closed-loop carbon recycling process makes SAF a more environmentally sound choice for aviation fuel, contributing to a greener and more sustainable aviation industry.

The author's aircraft being refueled with SAF.

expand production, and improve the sustainability of SAFs. The program's goals are a minimum 50% reduction of greenhouse gas emissions and "supplying sufficient SAF to meet 100% of aviation fuel demand by 2050."

The lofty goals of the challenge are net-zero emissions and full decarbonization of US aviation by 2050. A SAF Challenge Roadmap examines current production capacity and current and projected fuel needs. It identifies six action areas to help meet the initiative's goals.

To reach the 100% aviation fuel demand goal, "more than 400 biorefineries and 1 billion tons of biomass (or gaseous carbon dioxide feedstock) will be needed to produce 35 billion gallons per year by 2050."

The Grand Challenge's success would significantly impact rural areas by creating biomass production, sourcing, and processing jobs. It would also enhance crop and forest productivity, provide opportunities for underserved communities, encourage industry commitments, and enhance public-private partnerships.

Impressive Progress, but is it Enough?

These stats are all impressive and are cause for celebration. Still, they also need to be appreciated against the reality of jet fuel consumption, industry growth worldwide, and current headwinds slowing adoption.

The US Energy Information Administration (EIA) reported that the average daily jet fuel consumption in the United States in 2022 was 1.5 million barrels or 22.9 billion gallons per year. Of this, US airlines consumed 17.5 billion gallons. In comparison, only 15.8 million gallons of domestic SAF were produced in 2022, representing just 0.07% of the total annual jet fuel used in the United States.

Worldwide annual jet fuel consumption hit its highest peak at 95 billion gallons in 2019, and after the COVID drop in demand, it is on pace to surpass that peak in 2024 with 100 billion gallons consumed.

Mix in continued travel demand and growth that may increase 17% for America-Europe travel and up to 61% for travel within Asia by 2030, according to Bain & Company, balancing the rate of technological development of SAF, availability and any incentives, reaching IATA's net zero goals start to seem like moon shots.

At a recent IATA meeting, Qatar's CEO, Akbar Al Baker, criticized IATA's Net Zero commitments as "a PR exercise" and doubted the ability of IATA to comply with their 2030 and 2050 goals.

Kenneth Quinn, an aviation lawyer and general counsel to the Flight Safety Foundation, penned an editorial in response to Baker's criticism by outlining many challenges facing aviation's net zero goals. He stressed the importance of ambitious industry collaboration and government investment at scales similar to President Kennedy's lunar program.

Neste's VP of Renewable Aviation Americas, Michael Sergeant, shared that the industry will invest more if policy shows more significant long-term commitments beyond broad initiatives such as the SAF Grand Challenge.

Financial incentives such as the US's Biomass-based Diesel Blender's Tax Credit provided under the Inflation Reduction Act offer a $1.25 base credit per gallon of SAF. Still, this incentive expires in 2024, replaced by the Clean Fuel Production Credit, which places increased requirements like domestic production, lowers potential credit, and will only be available until 2027. The critical role of SAF in decarbonization necessitates sustained and longer-term governmental support and incentives to achieve the prescribed quotas.

Price-at-the-pump challenges must also be addressed, with the total cost of greenhouse gas emissions and their impacts factored in. While the fuel at the pump, say in Texas, might be cheap when comparing conventional jet fuel to SAF, the social costs and impacts of continuing to use fossil fuels are not accounted for.

As the world grapples with increasingly severe climate challenges, the aviation industry's strides towards sustainability are commendable. However, the urgency of reducing greenhouse gas emissions remains a pressing concern. Time will be the ultimate judge of whether our efforts will be enough to make a meaningful impact in averting the worst consequences of climate change. We must continue to push for further advancements in sustainable aviation fuels and commit to ambitious collaborative actions to safeguard our planet's future. T&T

Tigre Pickett *is a commercial single- and multi-engine pilot type rated in the Citation 525-series jets. With his father and Co-Captain, Rich Pickett, Tigre manages multiple CitationJets in southern California. Tigre has a passion for aviation and loves to fly various aircraft, exploring new destinations with his family in their Cessna Turbo 206. You can follow his exciting journey as a professional pilot alongside Captain Pickett on their YouTube channel and find more aviation content on* **PersonalWings.com.**

The Future of E-Fuels for SAF

by **Tigre Pickett**

The bulk of Sustainable Aviation Fuel (SAF) used in aviation today is from feedstocks like animal fats, vegetable oils, and waste greases — collectively known as Hydrotreated Esters and Fatty Acids (HEFA).

But other technologies are being tested and promise to improve efficiency. One such alternative is power-to-liquid fuels (PtL or e-fuels). These synthetic liquid hydrocarbon fuels use renewable electricity to break water into hydrogen and oxygen and combine them with non-fossil carbon dioxide to produce fuels.

Neste is one of the innovators in the PtL research and development field. Jonathan Wood, VP of Global Commercial & Technical, Renewable Aviation at Neste, recently shared the potential of PtL for the future of aviation.

Twin and Turbine: Given the constraints on feedstock availability globally for SAF, what efforts is Neste focused on for e-fuels or power-to-liquid technology?

Jonathan Wood: In the short term, Neste plans to use green hydrogen to support the refinery processes sustainably. In the longer term, we also plan to use hydrogen as a raw material for e-fuels, further supporting our climate and sustainability goals.

The potential of technologies like PtL could be substantial. PtL is a complementary technology for future sustainable fuel production. We need breakthrough innovations and continued focus on research and technology development to provide the most cost-efficient and value-creating solutions possible for the future.

In 2022, Neste agreed to build an integrated Power-to-Liquids (e-fuels) demonstration facility at VTT Bioruukki Pilot Centre in Espoo, Finland, for CO2 capture, green hydrogen and e-fuels production.

> The potential of technologies like PtL could be substantial. PtL is a complementary technology for future sustainable fuel production.

In alignment with Neste's ambition to reach carbon-neutral production by 2035, we are working on a 120-megawatt electrolyzer project to produce green hydrogen at our refinery in Porvoo, Finland. Neste has begun the introductory engineering phase of the project, and with an investment decision on track in 2024, green hydrogen production could start as soon as 2026.

In Rotterdam, Neste is setting up a demonstration unit for green hydrogen production — the world's first multi-megawatt electrolyzer based on the innovative SOEC (solid oxide electrolysis cell) technology integrated into industrial production.

But we must be clear that PtL will not be feasible in meaningful quantities before 2030. We are also looking at other sources of sustainable feedstocks that could be lower cost and more quickly implemented at scale, such as novel vegetable oils, agricultural and forestry waste, municipal solid waste, and algae. These sustainable raw materials could be enough to independently meet future renewable aviation fuel needs. So, together with PtL, we can see a pipeline of feedstocks and associated production technologies to deliver on aviation's net zero challenge.

T&T: What are the challenges and opportunities associated with PtL technology, and what are the cost implications of using PtL technology?

JW: One of the challenges of PtL technology is that the production of synthetic fuels from green hydrogen and carbon dioxide has not been commercialized and is higher cost than alternatives. It requires new SAF production facilities, a significant increase in available renewable power on an ongoing continuous basis, and material sources of carbon.

HEFA-based SAF remains the most viable and scalable solution for the next ten years, using waste oils, fats, and other bio-based oils (e.g., novel vegetable oils and intermediate crops that do not cause land use change and help regenerate soil quality).

The other challenge is the lack of regulations that can encourage investment decisions to make this technology commercially available, given the level of capital expenditure is significantly higher than existing HEFA-based SAF projects. Supply support can come through investment incentives, while mandates for using renewable fuels, specifically for PtL-based SAF, support demand. In addition, we also need policies that ensure that the cost of carbon emissions is reflected equally in fossil fuel pricing. Currently, the cost comparison with SAF is not on a like-for-like basis.

As well as a significant increase in renewable power production capacity, we need the associated electric grids, pipelines and storage, and other infrastructure elements to be developed and maintained to meet the needs of the industry. Permitting processes also have to become quick and transparent.

To summarize, the government and industry must collaborate closely to make a positive business case for green hydrogen and PtL-based SAF, enabling deployment at scale from 2030 onwards.

T&T: What are the environmental benefits of using PtL technology?

JW: PtL has the potential to unlock new renewable feedstock pools beyond bio-based sustainable raw materials and reduce reliance on fossil fuels dug out of the ground.

We now know that increases in carbon in the atmosphere from fossil fuels have contributed to more than one degree (Celcius) of global warming compared to pre-industrial times. This increase in carbon could cause irreversible climate change if not addressed by curtailing the use of fossil fuels. The case for fast action is clear.

PtL needs hydrogen and carbon. Green hydrogen is generated without incremental emissions when using renewable power. The carbon required to make a renewable liquid fuel is the second challenge — bio-based carbon sources will continue to be required, ideally concentrated in locations close to the renewable power source for the green hydrogen. Direct air capture is a longer-term option, but once again, it requires significant additional amounts of renewable power and is higher cost given the low concentration of carbon in the atmosphere — but pilot plants are in development.

SAF-Specific Questions

T&T: How does Neste see PtL technology fitting into the future of SAF production?

JW: Neste expects that after 2030, industrial-scale volumes of PtL can become available. However, it will require time to scale up, and all independent studies indicate that it will be a significantly higher cost to produce than HEFA-based SAF. We see the future growth in the supply of SAF building on the foundation of HEFA-based production with other new technologies, including gasification+synthesis and alcohol-to-jet (ATJ), also playing a role. PtL will also play a big part in the future production of SAF.

T&T: What key partnerships has Neste formed to advance the development of SAF?

JW: No company can do it alone when it comes to energy transition. Neste relies on an ecosystem of partners to deliver sustainable products like SAF; these include customers, technology partners, and industry experts.

Moving toward 100% SAF: Neste has been collaborating with engine manufacturers, airlines, and other partners to test the viability of using 100% SAF in aircraft.

Projects: Airbus, Boeing, and recently Bell Textron made the Bell 505 the world's first single-engine helicopter to fly on 100% SAF.

From grey to green infrastructure: We used pipelines that previously moved fossil fuels to deliver SAF to SFO. Last June, we delivered one batch of SAF from Texas to LGA New York using the Colonial Pipeline. Examples like these show the potential of leveraging what is often considered 'grey infrastructure' to fight climate change.

T&T: What are the research and development initiatives Neste is undertaking to improve the production of SAF?

JW: In addition to the PtL mentioned above, Neste is researching the potential of other sustainable future raw materials, making future renewable products from novel vegetable oils & oil-bearing plants on otherwise unused land, lignocellulosic feedstocks (i.e., agricultural and forestry waste), algae, and municipal solid waste.

T&T: What technological challenges does Neste face in producing SAF?

JW: Neste has been producing SAF since 2011. As it is compatible with the existing energy infrastructure, there are no technological challenges to produce and supply the fuel to the end users, i.e., airlines at airports. However, increasing availability to replace fossil jet fuel fully requires a massive investment, a ramp-up in production capacity and an increase in available sustainable feedstocks. This additional investment and feedstock cost means that SAF will be more expensive than fossil jet fuel (with its associated incremental carbon emissions) for some time.

The critical issue is ensuring sustainability and delivering a reduction in net greenhouse gas emissions. Neste has a strict supplier code of conduct, meaning that our suppliers should have the same commitment as us: conducting business to protect the environment, biodiversity, and human rights. If a supplier can't meet this, we don't do business with them. T&T

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SCAN ME

Editor's Pics

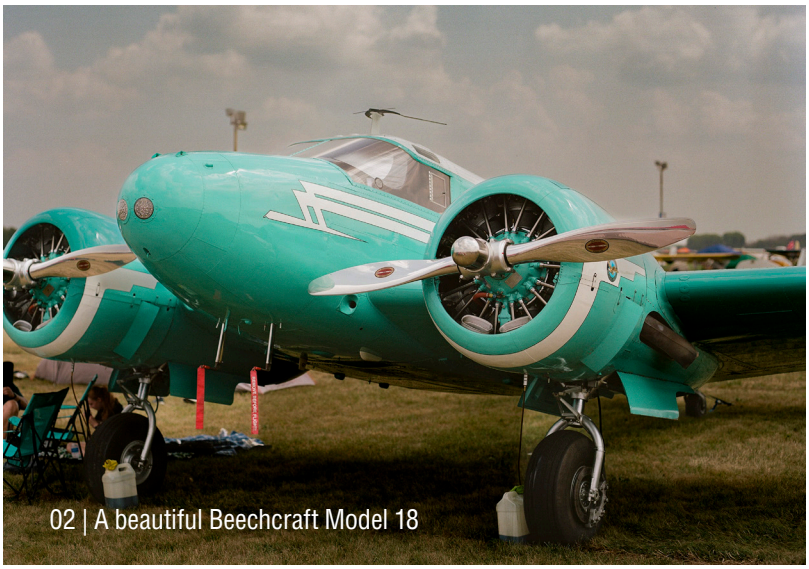
Photos & Story
by Lance Phillips

01 | NASA's Super Guppy

THE PENTAX 67 AT AIRVENTURE IN *Oshkosh, Wisconsin*

The Pentax 67 was produced in various iterations between 1969, the year I was born, and 2009. The version I own was produced in the early 1990s, the penultimate model of the series. It's a 5-pound beast that is usually seen with a large wooden handle sticking out from the left side of the camera (as you look at it from the back). I don't have the handle, though, as I opted for a custom-made, much smaller wooden handle that comfortably fits on the right side of the camera (again, as you look at it from the back). Pentax made a whole ecosystem of beautiful, world-class lenses for this professional series of cameras; however, the one lens you'll see most often is the renowned 105mm f2.4 powerhouse. This lens is approximately normal, or roughly equivalent to a 50mm on a regular 35mm frame (or full-frame digital sensor). When you see the images this camera and lens combination produces, you'll understand why it was in production for 50 years.

I own four cameras – 2 digital full-frame Leicas, 1 medium format film Hasselblad and the Pentax 67. Each of these is remarkable in its color reproduction and the beautiful resolution of the in-focus subject. NASA took Hasselblads into space for a reason. Leica rangefinder cameras have been in production and in use by the world's most renowned photographers for almost a century (Leica crafted the first 35mm camera for the public in 1925). And the Pentax produces images that truly captivate. I especially love portraits on the Pentax 67, but as you can see here, airplanes are fun subjects, too. T&T



02 | A beautiful Beechcraft Model 18

03 | The Cessna 310 from TV's Sky King

04 | Boeing's Dream Lifter welcomes all to AirVenture

05 | A colorful Mooney M20

06 | An Ercoupe on display

Eclipse 500

Damon Georgalos has built a life around machines. Whether it's the businesses that he operates in several diverse industries or the collection of high-performance cars he drives, the 33-year-old aviator is intentional about seeking performance. This intentionality includes the 2008 Eclipse 500 that he purchased in 2020.

With cars being one of his keenest lifelong interests, it's easy to conclude that one of the highest compliments that Georgalos can give is automotive-related. As he explained, there are a lot of similarities between this very light jet and fine motor vehicles.

"The Eclipse 500 flies like a little sports car and is a great aircraft. I love the side stick aspect of it, and I'm way more comfortable with that than a yoke. When I fly the airplane, it's a

Damon Georgalos of Heber City, Utah, flying his 2008 Eclipse 500.

part of me and does everything effortlessly. I can put it into thirty-knot direct crosswinds like it's nothing. I'm sweating a little over here, but the plane is just knocking it out like it's not a big deal. The side stick makes it feel like the plane is a part of you."

He stated that ground-bound wheeled vehicles were the real reason why he decided to become a pilot in the first place.

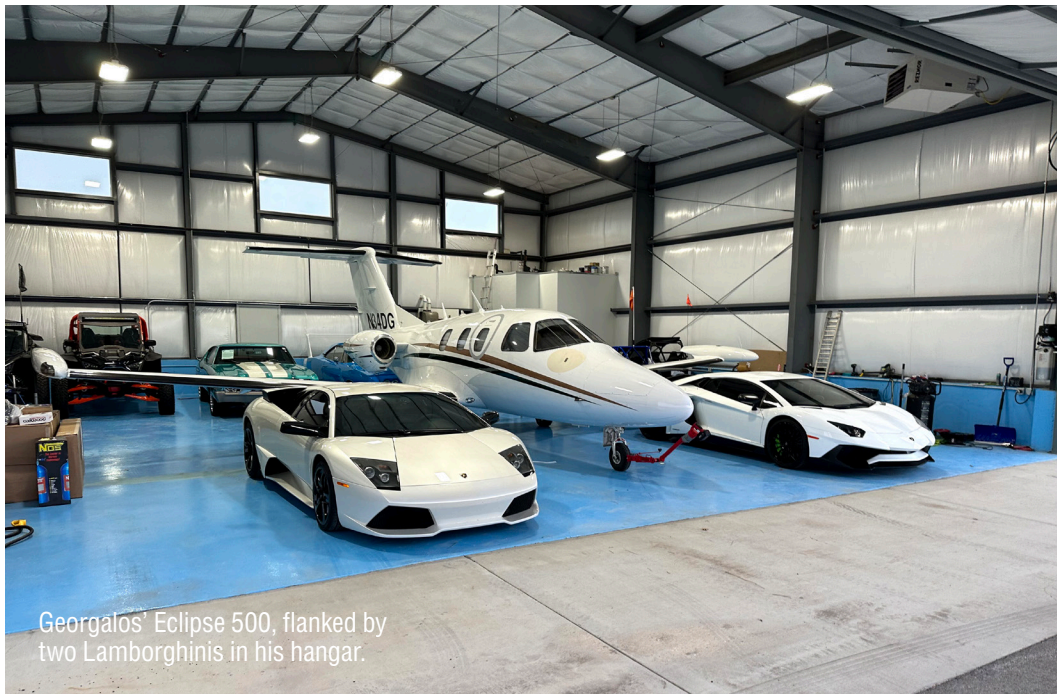
"I started flying in 2017. I lived in Breckenridge, Colorado, so the closest airport to me was Eagle [County Regional Airport, KEGE]. At the time, I was going down to the dunes in California a lot during the winter. We drove our 45-foot motorhome, pulling a big stacker trailer behind it. The wintertime in the Rocky Mountains is unforgiving, so we constantly drove through blizzards. I decided that after too many crazy instances with the weather, it might be better to fly back and forth and leave our stuff there. I had always wanted to fly anyway, and I originally wanted to fly fighter jets as a teenager."

Georgalos would not go to the Air Force or the Navy; instead, he focused on several entrepreneurial endeavors while still a teenager. His business successes allowed him to pursue his dream of learning to fly, albeit as a civilian.

"I completed my private pilot license eight or nine weeks after starting flight lessons and got an A36 Bonanza the next day. The insurance company didn't like that too much. They said jumping from an Archer to a high-performance, complex aircraft was too big of a jump. I did fifty hours of dual instruction in the Bonanza before soloing. I flew with my instructor for a week and then to Florida from Colorado. After getting signed off, I flew to Jackson Hole, Wyoming, with my friends the next day. I used that plane for around two and a half years and racked up 450 hours of total time."

"I then bought a Malibu Matrix, the unpressurized version of the Mirage. I got a sweet deal on it, and the guys selling it were giving it away about a hundred grand less than it was worth. I took that deal as it was a no-brainer. I bought it in cash but decided that I wanted to get my money back out of it. So, I called a finance company and said I wanted to refinance. They said no problem, but after going through the process, they approved financing for two million dollars. I only wanted to refinance for a few hundred grand, but they said they couldn't. Maybe they misunderstood, 'But you are approved to buy something else if you want!' they told me."

In addition to his Eclipse, Georgalos has an enviable collection of sports cars.



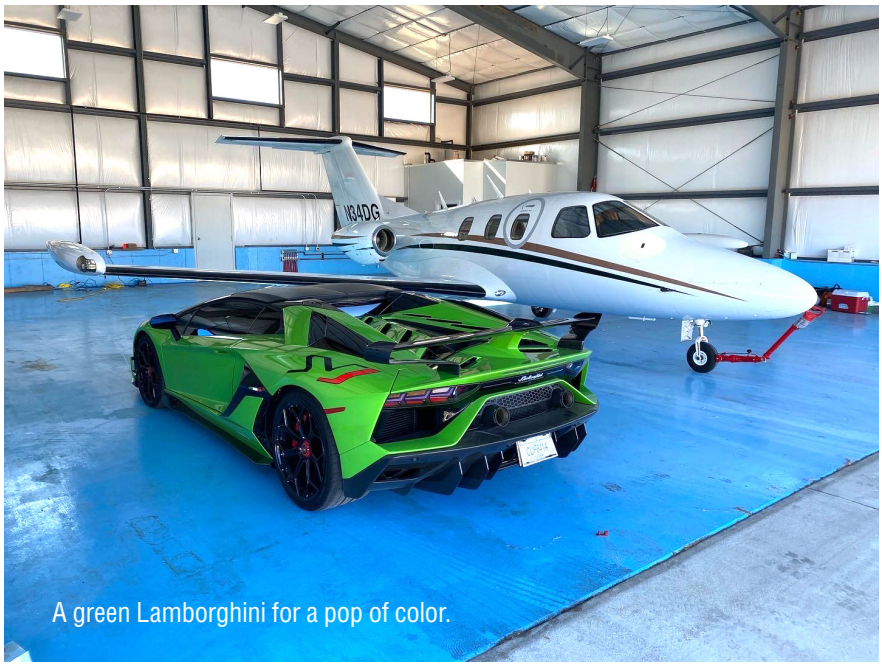
Georgalos' Eclipse 500, flanked by two Lamborghinis in his hangar.

The wheels started turning once Damon learned that he could get significantly more airplane than he was looking for.

"I was like, 'shoot. Okay!' My buddy had an Epic, so I considered that as an option. But insurance would prefer something other than an experimental aircraft, coupled with my flight time. I started looking at a Meridian and was about to close on a 2013 model. It was pretty pricey, so I reconsidered."

Spoiler alert: Georgalos ultimately settled on an Eclipse 500. But several naysayers said the aircraft wasn't the best fit for his mission. He couldn't be talked out of the model, though, especially as he began doing tailored research into the plane and its capabilities.

"I had thought about this jet, but people always tried talking me out of it. Things like, 'It's not a good air-



A green Lamborghini for a pop of color.

plane' and 'the performance sucks,' Or 'You will never be able to fly it out of your airport in Heber [City, Utah],' 'or be able to fly with passengers and full fuel.' Just things like that. So I started researching the plane myself, and it didn't seem nearly as bad as the opinions people were sharing without knowing the plane personally," he began. "I knew about the company being in bankruptcy for a long time. I talked with some facilities about parts availability. They told me that support isn't as big of an issue as people try to make it out to be. Parts are pretty easy to come by and whatnot."

He made his decision and jumped right in. Georgalos acted so quickly that he had a plane lined up for purchase before scheduling type-rating training. Like the challenges with his Bonanza, The Eclipse's insurance requirements were a point of contention.

"I decided not to sign the contract on the Meridian and found a 400-hour total time Eclipse out of Texas. I only contacted flight schools once I had already purchased the plane. Initially, three flight schools told me there was no way, with so few hours, that I could get my type rating for that plane. They told me that the hardest thing in aviation to do is get a type rating, and with my time, it just wasn't possible for an Eclipse. The insurance companies didn't like the idea, but I got one to agree to require fifty hours of dual instruction in the plane like I had in my Bonanza."

He continued his aircraft transition explanation, noting that he found a solution to his training dilemma shortly after overcoming the insurance hurdles. He discovered a well-known Eclipse flight instructor willing to accept him as a student. In addition to his enthusiastic dedication to learning, one of the things that swung the decision in Georgalos' favor was that he was only 30 years old at the time. The instructor believed his youth could be a benefit in the daunting task of learning to fly such a complex machine.

"We flew around the whole Southwestern United States, flying from cheapest fuel to cheapest fuel. We would fly for a few hours in the morning, stop for lunch, then fly for a few more hours and hit a hotel. To wake up and do it all over again the next morning. As this happened, I remember watching the news and learning about this Covid thing starting to spread around in February 2020. I made it out of that with two weeks to spare before quarantine requirements set in, finishing my 50 hours and taking my checkride. I have had the Eclipse for three and a half years, with around 470 hours flying it. I love it. It's just a great aircraft."

Overall, the plane meets Georgalos' standards and is relied upon in its varied missions, including short and long stage-length trips.

"It has a few things that limit it, but for the most part, I can get 95 percent or better of what I want to get done. I have three kids, so I am flying around with five seats constantly filled. My typical missions are around the West Coast, and I often fly to California and Las Vegas. But I have stretched its legs quite a bit, having gone to The Bahamas once and South Florida for business. When I go that far, I typically land in Hammond, Louisiana, with some of the cheapest fuel in the country, then fly right over the Gulf. Coming back to Utah, it's right on the money that I have to stop perfectly in the middle, and I'm right at the reserve amount I want to land with. I always make it back in one fuel stop, but it's tight," Georgalos claims.

"One of the things that I love the most about the plane is that it's pretty short-field capable, especially for a jet. I fly into many airports that no other jets have ever flown into. I'm constantly flying out of airports with 3,000-foot runways where you typically only see small, single-engine aircraft. People are staring at me during those times, and it's awesome! My Eclipse is version 2.5, so I have auto throttles and ABS. Those capabilities make the aircraft ultra-useful when flying into small airports with tight patterns."

Not only does Georgalos proclaim that the Eclipse 500 is a blast to fly, but he also says it's an economical performer.

"I love the plane because it's super-efficient and cheap to fly. During longer trips, I fly at FL400 or FL410. At these altitudes, I'm seeing a total fuel burn of about 54 gallons per hour. Lower around FL300, we'll see fuel burns in the mid-60s [gallons per hour]. So, it is an efficient airplane, especially up high. For maintenance, you will have a year when you spend twenty grand, and you'll have another year where you'll spend three or four times that. Averaging that out, call it 50 thousand. If you fly a few hundred hours yearly, it's not too bad. I think of the Eclipse as around a $700-per-hour plane, which for a jet is insane." T&T

IFR Logbook:
Another Column

by **Thomas P. Turner**

Instrument training, Practical Test evaluation, most IFR practice, and the FAA's requirements for recency of experience are measured primarily in getting the airplane down from altitude. There's very little focus on proficiency for making a takeoff and departure in IMC. 14 CFR 61.57, Recency of Experience, tells us that to remain IFR current in an aircraft, the only things we need to have recent experience in are:

- Six (6) instrument approaches,
- Holding procedures and tasks, and
- Intercepting and tracking courses through the use of electronic navigational systems.

The Airman Certification Standards (ACS) and requirements of an Instrument Proficiency Check (IPC) are similar. There is no specific requirement to demonstrate proficiency in making low-visibility or IMC takeoffs.

Instrument training and evaluation is weighted heavily toward arrival and approach procedures. We log the number and type of approaches we fly and consider precisely flying an arrival procedure the ultimate test of our IFR ability—even if we let an autopilot do the job for us. Way down on the training/evaluation priorities list, if it's there at all, is recency of experience and proficiency in departure procedures. Low-visibility takeoffs are rare in practice. We probably don't spend much time training and reviewing them, we're not evaluated on our ability to perform them, and we don't track our proficiency in low-visibility departures by logging the number we fly or practice or when we last experienced one (or six).

Taking off into the murk shouldn't be any riskier than making an instrument approach—at least in theory. There are other hazards, though, that pilots face in addition to the weather itself when making a departure in IMC. These threats are greatly magnified when the pilot's visibility is restricted. Let's look at four such hazards:

Getting up to speed: You might be a little worn out by the time you begin an instrument approach at the end of a flight. But even if you are, you have plenty of time to get "into the groove" and prepare for a low-clouds or

low-visibility (or both) arrival. In an IMC departure, however, you have no way of knowing for certain you're up to speed for an IMC departure until you're actually in the air. You delay finding out for certain whether you're at the top of your game until you actually enter this high-workload condition with the airplane fairly slow and at a high angle of attack, close to the ground. Before a low-visibility takeoff, there isn't any time to catch up to get the feel for the airplane or to detect and correct for any missed briefing or checklist items.

Airplane checks and performance: The airplane may pass all preflight and Before Takeoff checks, but it is only really put to the test when you take off. If you've missed a checklist item, you'll probably find it early in flight. If there is anything that isn't quite right (or worse) with the airplane or an engine that is not immediately obvious during the run-up, now's the time it may manifest itself in decreased or impaired performance.

Fatigue: The hazards of low visibility may be compounded by fatigue-impaired judgment, especially during an early morning departure or late in a duty day. Evaluating your fatigue state is a factor to consider before all IMC departures.

False climb illusion: Somatogravic or "false climb" illusion is the result of fluid moving in a pilot's inner ear when an aircraft accelerates. Pilots sense this motion as pitching upward—a false sensation of climb. This can trick a pilot into pushing forward on the yoke to "recover" from the perceived climb, forcing the airplane downward into terrain.

Another column

Perhaps another column is required in our logbooks to record the number and dates of actual or simulated low IMC departures. We frequently have no recent experience in flying the procedure. There's no recency requirement to take off into IMC. But you can put such a requirement on yourself. When totaling up your approaches and holds to confirm you're IFR, ask yourself when you last flew and actual or simulated departure into IMC. If you've not done that a couple of times in the previous six months, it might be worth your time to log a couple in the airplane with an instructor or in a flight training device or simulator. It adds to your safety and proficiency; with good risk management and a solid-gold "departure alternate" airport in case you have a problem after takeoff, it also adds to the utility of your aircraft. T&T

Thomas P. Turner *is the author of the FLYING LESSONS Weekly blog (www.mastery-flight-training.com) that inspires pilots to pursue Mastery of Flight.™ A prolific writer, speaker and flight instructor, Tom has been inducted into the National Flight Instructor Hall of Fame.*

SO, YOU OWN AN AIRCRAFT... NOW WHAT?

We can all agree life is more beautiful in the air, but what happens when you have to put your bird down for maintenance, or worse, unexpected squawks? Whether you've been flying for years or recently purchased and started operating an aircraft, knowing what to expect when routine and unforeseen issues arise will make your life as an owner or operator more satisfying. Having a reliable shop that cares not only about the aircraft but also about you makes the experience go from satisfying to exceptional. We've been doing exactly that for over 70 years. Our teams are just as passionate about the customer service they deliver as this incredible industry we all love.

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Javier Morales
Avionics Technician

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Jessica Haughn, Controller

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Facial Recognition

It started out as a fantastic idea. "Come fly right seat in my CJ2+ to Mexico," offered Randy Broiles, Chairman of the CJP Safety Foundation. Randy is a wine connoisseur and had planned a four-day excursion to Valley de Guadeloupe, a burgeoning wine region just south of Tijuana. Patty and Cindy Broiles were looking forward to a long weekend of relaxation.

What could possibly go wrong?

On the morning of departure, I woke up with a terrible sore throat. But since I was just the "right seat guy," I rationalized that I was fit to fly. Our westbound trip from Houston at FL430 went perfectly. After a fuel stop in Tucson due to 120-knot headwinds, we landed under clear skies at Abelardo L. Rodriguez airport.

A little over an hour later, after a beautiful drive along the Pacific coast, we arrived at the gorgeous resort nestled in the vineyards. Our casa at El Cielo Winery and Resort was lovely, and the wine was fantastic. The entire area was probably what Napa looked like fifty years ago.

My increasing cough and congestion were masked by the atmosphere and the Broiles's hospitality.

And, of course, the wine. I took a couple of over-the-counter medicines to keep up with the group.

After Cindy pushed me into the fence.

A new mustache to cover my indiscretion.

After a full day of touring and tasting, it was time to gather for dinner at a Michelin-starred restaurant located along a dark, unlit gravel road. The driver remained behind while we walked the quarter mile on a narrow pathway to the establishment. The food was marvelous.

Several hours later, it was time to return to the van.

Now, in pitch-dark blackness, we retraced our steps. Emboldened by several glasses of wine and some cold medications, I insisted on leading the group along the shrub-covered gravel path.

Up ahead, I saw our van 30 feet away parked along the road. "Just follow me," I yelled to the group as I picked up the pace.

And then it happened.

I walked straight into a barbed wire fence. Never saw it. I felt a sting on my face as I recoiled from the collision. Then blood coming from my mouth. It was so dark I still could not see the barbed wire.

Stunned, the group extracted me from the fencing and helped me into the van. We drove quickly back to the resort. A medic was called. I was mostly embarrassed. Disfigured, but embarrassed.

The medic, who spoke no English, cleaned the wound. I had the translator ask him if I would be able to play the piano after I recovered. He said he thought so. Then I told him that was odd because I had never been able to play the piano before. He shook up and down for several minutes laughing at the joke.

Returning to Dallas, I had to come up with a reason for walking head-on into a barbed wire fence.

"Cindy Broiles pushed me," I told everyone. That story is working pretty well so far.

Now, I have a mustache to cover my indiscretion. Patty says it looks more like a fungus.

Fly safe.

T&T

David Miller *has owned and flown a variety of aircraft from light twins to midsize jets for more than 50 years. With 6,000 plus hours in his logbook, David is the Director of Programs and Safety Education for the Citation Jet Pilot's Safety Foundation. You can contact David at* **davidmiller1@sbcglobal.net**.