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Perform in the Air**

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⌵ **Noble Flight Simulator**



LAURIE EINSTEIN KOSZUTA has been a freelance writer for many years and along with her husband, John, now owns a Cirrus SR22. With John as the pilot-in-command and Laurie as the partner, they regularly travel to see family, visit friends and enjoy our beautiful country. You can read more of Laurie's work on her website: www.laurieeinsteinkoszuta.com.

Practice on the Ground, Perform in the Air

How Simulators Are Defining and Refining How Pilots Train

by Laurie Einstein Koszuta

“An airplane is a terrible place to learn pilot skills,” said Tim Lewis, a Platinum Cirrus Standardized Instructor Pilot (CSIP), provost at COPA University and a designated pilot examiner (DPE). “It is a place to practice, not a place to learn.”

This perspective may seem counterintuitive, especially in a world where flight training has traditionally centered around time in the cockpit. However, according to experienced instructors like Lewis, the use of a simulator has become one of the most effective training tools available to pilots long before they ever leave the ground.



Lewis' view is unequivocal. Simulators allow pilots to build foundational skills in a safer, more flexible and more efficient environment. Students can practice radio communications, learn complex avionics and autopilot systems, develop flight-planning skills and build familiarity with cockpit flows and checklist discipline.

This belief is echoed by veteran instructor Jim Ratliff, CFI, CFII, Master CFI, Platinum CSIP, and retired Air Force and airline pilot with extensive experience teaching in Level D simulators.

"I've always been a huge fan of simulators because of their efficiency," Ratliff said. "Training in flight schools can begin in a classroom where concepts are introduced and reinforced through materials like readings and videos provided by Cirrus. Then, the simulator bridges the gap between theory and application."

Repetition, Proficiency and Confidence

Both instructors agree that repetition of certain maneuvers is a dominant feature of simulator training, which is something that would otherwise be difficult, if not impossible, to replicate in an actual aircraft.

Ratliff ties this to a core educational principle known as the "law of exercise," which states that repetition strengthens learning.

"Confidence comes from repetition and continuous practice," Ratliff emphasized, "so that by the time the pilot gets to the airplane, it feels natural because they will already know what to do."

“As simulation technology becomes more widely available, its role in training continues to expand.”

In a simulator, a student might complete six to 10 traffic patterns or instrument approaches per hour. In an aircraft, that number is often cut in half due to air traffic control delays, vectoring and repositioning.

Equally valuable is the ability to pause, reset and replay. “If a student gets confused,” said Ratliff, “we can stop the scenario, discuss what happened and run it again. In an airplane, instructors must wait to debrief on the ground or attempt to provide instruction while flying, something many students struggle with while in the air.”

This repetition leads to procedural proficiency. Students can practice until they develop true muscle memory. By the time they transition to the airplane, it becomes less a place of discovery and more a place of validation, which results in better performance and reduced workload.

Mastering Automation and Modern Cockpits

Simulators also provide an ideal environment for mastering systems and automation, both areas that continue to contribute to a high incidence of accidents linked to human error.

“Working with the autopilot is critical,” Ratliff pointed out. “Many accidents happen because the pilot doesn’t understand what the airplane is doing versus what they think it’s doing. In that way, pilots can experience and correct those mistakes before they ever occur in actual flight.”

Pilots can repeatedly practice loading, modifying and executing flight plans while observing how the system responds, building both understanding and confidence. Simulators are increasingly used to assess readiness before a checkride and to work through pre-solo procedures.

Emergencies

Both Lewis and Ratliff agree that simulators are invaluable for safety and emergency training. Pilots can practice high-risk

scenarios such as engine failures, electrical fires and system malfunctions, all situations that would be too dangerous to duplicate in an airplane.

“In a simulator, you can practice an engine failure and a CAPS pull repeatedly. It is training that can make the difference between life and death,” explained Ratliff.

Ratliff pointed to a real-world example from Tidal Aviation, an authorized Cirrus Training Center at Houston Executive Airport (KTME), where he serves as Chief Flight Instructor.

“We had our first CAPS pull in our fleet last November,” he said. “The pilot executed the procedure flawlessly during a catastrophic engine failure at approximately 8,000 feet. He said it was just like he trained and everything went by the book.”

Using the Perspective+ system, the pilot carefully monitored his exact altitude and worked through the emergency checklist. He briefed his passenger on what was about to happen and deployed CAPS at approximately 2,800 feet above ground level (AGL), leaving ample time to execute every step correctly. There were no injuries and everyone went home that night.

The pilot credited simulator training with giving him the confidence needed to act decisively under pressure, reinforced by actually pulling the CAPS handle numerous times in the simulator. “He knew exactly what 45 pounds of force felt like,” Ratliff noted.

Efficiency, Cost and Accessibility

Simulators also offer a compelling economic advantage. A typical one-hour lesson in the simulator with an instructor may cost between \$175 and \$300 per hour, significantly less than in an aircraft.

Pilots can invest in home setups ranging from basic procedural trainers – such as Garmin desktop trainers – to consumer platforms like Microsoft Flight Simulator. More advanced Cirrus-specific and general aviation fixed-base systems are available from companies like Noble Flight Simulation, RealSimGear, Flight1 Tech and ALSIM. These higher-end systems can replicate full cockpit environments with high fidelity, though they are non-motion devices and come at a significantly higher cost.

Of course, no simulator is perfect.

“It’s not an airplane and it’s not meant to be,” emphasized Lewis. “It cannot fully replicate every possible scenario or sensation. But that is not its purpose. If you wanted it to be exactly like an airplane, you’d have to spend the same amount as an airplane. The goal is to simulate key elements well enough to allow effective, repeatable training.”



Lewis notes that every simulator, including the most advanced ones, has limitations. “The problem is that many pilots don’t fully understand the limitations,” he said. “They try to make the simulator do things it simply can’t do, even though a real airplane could. That creates a disconnect between expectations and reality.”

He adds that too often pilots approach simulators too casually. They don’t train with intent or with a plan. In some cases, it becomes more of a video game than an instructional experience.

Training With Intent

Instead, Lewis advocates for structured, scenario-based training before independent simulator use. Practice should reinforce correct procedures, not invent new ones.

“I think a disciplined approach is far more valuable than boring holes in the sky, going inverted and trying to find an aircraft carrier to land on,” he said. “That kind of unstructured training is not reinforcing anything positive.”

He emphasizes setting clear boundaries.

“I’d like to see pilots say, ‘I’m going to depart out of this airport, then simulate an alternator failure.’ After that, maybe they introduce an oil pressure issue and follow it through to a potential

engine failure. Then they should work through the problem, run the checklists correctly and execute the scenario,” Lewis said.

Risk of Poor Training

There is, however, a risk of poorly guided practice, which can reinforce bad habits. Educational theory refers to this as the “law of primacy,” which states that what is learned first tends to stick.

“I cringe when someone buys a home simulator before being properly trained,” said Lewis. “They’ll watch YouTube videos or take advice from friends and develop habits that are hard to break.”

Currency Versus Proficiency

Several simulator brands are also FAA-approved training devices, which allow pilots to legally log instrument time and approaches, maintaining instrument currency.

But Lewis sees a potential for another common misunderstanding, one that can have serious consequences.

“I’ll have someone say, ‘teach my wife how to land the airplane in case I become incapacitated,’” he explained. “And I tell them, I have a better idea, CAPS.”

While it's technically possible to teach someone to land an airplane in a short session, Lewis says that's not the real issue. "Yes, we could teach her," he said. "But without ongoing training, without currency and proficiency, three or six months later, she wouldn't be able to do it safely."

The same principle applies to pilots.

"A pilot who doesn't fly often might come into the simulator and do six approaches in an hour. That makes them legally current," explained Lewis.

But legal currency is not the same as readiness.

"If that's all they do every six months, they're nowhere near proficient. And that's the difference between checking a box and actually being prepared," Lewis said. "If you're planning a trip and just need to knock the rust off, the simulator is a great tool."

The danger comes when simulators replace rather than supplement real proficiency.

"Skills degrade quickly in general aviation," Lewis said. "The simulator can help slow that, but only if it's used with intention."

Mission Rehearsal

Ratliff notes that another powerful use of the simulator is what the military calls mission rehearsal, the ability to fly a trip before ever leaving the ground. The pilot can practice departures, arrivals, approaches and virtually visit unfamiliar airports.

He described preparing pilots for very challenging destinations like the Eagle County Regional Airport (KEGE) near Aspen, Colorado.

"To prepare," he explained, "we can start with a scenario departing Denver, climb to about 16,000 feet, track over the fix where the approach begins, then work down the valleys and fly the approach into EGE with the weather set to clear skies. There are mountains all around and the descent is into a valley, dropping below the surrounding terrain. That way, the pilot can look around and see everything."

Then, the scenario is repeated with weather near minimums.

"At this point, they track the course going down that same mountain valley and know that there are rocks in the clouds on either side of them. Now they're engaged and paying attention."

Finally, conditions are set below minimums, forcing a missed approach, then a right turn into another mountain valley and a climb back through the clouds and above terrain before exiting safely.

"That's why we practice it," Ratliff said. "By the time they fly the real trip, it feels like they've already been there. It just adds multiple layers of safety to the entire trip."

Flexibility

Another key advantage is flexibility. Simulators can be programmed to create virtually any scenario and weather conditions, including clear skies, low ceilings, crosswinds, rain and



snow. This allows pilots to build situational awareness while learning to manage altitude, monitor systems and maintain checklists in a controlled environment.

“There are times when the weather’s not good enough to go out and fly,” said Ratliff. “As instructors, we can keep right on going because of the different scenarios we can create.”

Cirrus and Simulators

This year, Cirrus has introduced Mission Ready 2026, a free monthly offering of two pre-built simulator training scenarios for pilots with a Cirrus Approach account.

“The goal,” explained Lewis, “is to promote simulator use by providing scenarios for Cirrus SR pilots who fly both visual flight rules (VFR) and instrument flight rules (IFR).”

To be clear, Mission Ready is not a simulator, a new avionics feature, or a certification program, but a structured way for Cirrus pilots to get more out of simulator training, improve judgment and become safer, more proficient pilots.

Some of the current offerings of Mission Ready include:

- Over the Hills: McGhee Tyson Airport (KTYN) to Asheville Regional Airport (KAVL)
- The Windy City Corridor: Porter County Regional Airport (KVPZ) to Kenosha Regional Airport (KENW)
- Smoky Mountain Shuffle, Monroe Executive Airport (KEQY) to McGhee Tyson (KTYN)
- Cross Country on My Mind: McGhee Tyson Airport (KTYN) to DeKalb-Peachtree Airport. (KPDK).

As simulation technology becomes more widely available, its role in training continues to expand. Despite this growth, general aviation still lags behind commercial aviation in using simulation as a core training tool.

As Ratliff puts it, the use of simulators is about “taking people where they’ve never been and hope they never have to go.” ➕



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