Photo courtesy Precision Flight Controls

Simulators have come a long way since World War II. This is Precison Flight Controls' new Modular Flight Deck (MFD).

THE VALUE OF SIMULATOR TRAINING

Three-time master CFI/CFII/MEI/ATP Michael Leighton explains why he is a huge fan of flight training with a simulator.

By Michael Leighton

Simulator training has come a long way since the Link Trainer. This now primitive-looking trainer taught thousands of World War II-era airmen to safely fly in the clouds by simulating the pitch, roll and yaw of a real aircraft in flight.

Today, flight simulation technology is readily available to every pilot, not just military aviators. From full-motion level D sims that are so real that they have a tail number and you can take a type rating checkride in them, to desktop aviation training devices (ATDs) that are based on common PC technology, there is sim that fits any mission.

Several devices and classifications

In reality, the word "simulator" is somewhat misused. If the device moves (i.e., it has motion), it can be called a simulator. Simulators are classified from level A to level D, with D as the most advanced.

Flight training devices (FTDs), on the other hand, don't have motion. FTDs are classified with an FAA numbering system from one to seven.

Two other terms to know are Basic Aviation Training Device (BATD) and Advanced Aviation Training Device (AATD). Some AATDs have rudimentary motion and offer minor tactile "seat-of-your-pants" feel, while BATDs are mainly desktop procedure trainers without any motion. *(For more information on AATDs and BATDs, see the sidebar on page 34. —Ed.)*

AATDs are becoming common even at smaller flight schools.

A phenomenal training tool

I am and have always been a huge fan of simulator training. There are so many things you can do in a sim that you would never do in an airplane on purpose. Even the basic machines can allow the average pilot to be guided through the most complicated approach procedures and have the ability to pause at any time to figure it all out.

More advanced machines allow pilots to experience severe turbulence, the effects of ice on the airframe or simple and compound equipment failures. In the hands of a capable instructor, these devices are phenomenal training tools.

Recently the FAA reinstated a decision to allow up to 20 flight hours in an approved ATD to be applied toward an

instrument student's time requirements. This is especially helpful for the new instrument pilot, as understanding and flying approach procedures can be the most difficult part of learning to be an instrument pilot and learning that in an airplane in flight is more difficult than in a sim. After all, there is no "pause" button on an airplane.

More advanced sims allow the pilot to experience situations and failures that are too dangerous to do in the plane or are simply impossible to recreate, such as microbursts, in-flight fires or system malfunctions.

In the program that I run for one of the largest flight schools in the country, we put every student in the sim for 10 hours before we put them in the plane. In the sim, we can safely teach something as simple as starting a jet engine (without any risk of damaging one) or something as complex as a compound mechanical failure or a fire in the cockpit.

Noteworthy differences

Not everything about a simulator is identical to the real thing. Most do not fly exactly like a "real" airplane; they just don't have the same tactile feel.

More importantly, most sims do not use the exact same instrument and radio configuration as the aircraft you'll be flying in. Switches and buttons won't be in the same place, and "switchology" is an important aspect in flight training.

Further, if you are flying an older aircraft, the sim likely won't have the same autopilot that your aircraft has, either.

In addition to that, the quality of the visual graphics varies greatly—and that can be a limiting factor for what exactly you can do in that particular sim. For example, most AATDs are not approved for use in an Instrument Proficiency Check (FAR 61.57) because a circle-to-land approach is a requirement and the graphics are not good enough to qualify for that.

There is no substitute for flight training in your own airplane.

What they are great for

I tell my students that when transitioning to a new aircraft, simulator training is invaluable. The more complex the airplane, the more value I place on the sim.

Initial and recurrent instrument training is also the perfect venue for most of the BATDs and AATDs. It's less expensive than flying in a plane, and you have the ability to stop at any point, discuss the procedure, and then resume the approach.

This Link Trainer is on display at the Western Canada Aviation Museum in Winnipeg, Manitoba.

In the hands of a capable instructor, these devices are phenomenal training tools.

The Meridian (left) and Mirage (right) simulators at Legacy Flight Training in Vero Beach, Fla.

Legacy Flight Training offers pilots a Meridian simulator with Avidyne avionics.

Precision Flight Controls' Piper Fleet

Single-engine	
Warrior II	PA-28-161
Archer III	PA-28-180
Arrow III	PA-28R-201
Arrow III TC	PA-28RT-201
Arrow IV	PA-28R-201
Arrow IV TC	PA-28RT-201
Twin-engine	
Navajo Chieftain	PA-31-350
Seminole	PA-44-180
Seminole TC	PA-44-180T
Seneca V	PA-34-220T
Turboprop	
Cheyenne	PA-42

Aviation Training Devices: A brief explanation of the differences

By Tracy Cook

Basic Aviation Training Devices (BATDs) represent the lowest level of FAA approved ATDs. These systems are eligible for 2.5 hours toward the private pilot certificate and 10 hours toward the instrument rating requirements.

Instrument experience (i.e., currency) can also be accomplished in a BATD under FAR 61.57(c)(3) which allows for part of the time to be logged in the device while the remainder is required to be accomplished in the aircraft.

Advanced Aviation Training Devices (AATDs) are typically more sophisticated (and often more expensive) systems. AATDs allow for the same 2.5 hours toward the private pilot certificate, with an increase to 20 hours loggable toward the instrument rating, an additional 50 hours toward a commercial ticket, and 25 more toward an ATP.

Instrument experience can also be accomplished under the more liberal FAR 61.57(c)(2). This regulation allows for currency to be accomplished in its entirety on the AATD.

The current requirement—to have instrument experience time endorsed in one's logbook by a CFI—is the focus of a recent proposed amendment by the FAA.

It has long been argued that instrument experience does not constitute "training" and therefore should not require an instructor endorsement. Apparently the FAA agrees.

Tracy Cook is vice president of sales and marketing for Precision Flight Controls, Inc. He has been a private pilot since 1990. Send questions or comments to editor@piperflyer.org.

A good training regime for the average pilot would include sim training at least every other year, in addition to annual—or better yet, semi-annual—recurrent training on your aircraft.

I have one longtime student (who holds an ATP rating). She went to sim training prior to taking a flight to Vail, Colo. in her plane. In the sim, she shot the approaches to Eagle County Airport (KEGE) so she would be prepared, just in case she had to do it for real.

Eagle County Airport is located in a valley in the mountains and features some of the most challenging instrument approaches in the country. It was money well spent for her, as the weather went from VFR to IMC while she was she was en route, and she ended up flying the approach for real.

You don't need to be an ATP to find sim training valuable. Even a desktop BATD is useful for scraping rust off a pilot's instrument procedure thought process—and even though you can't log that time, it doesn't mean you didn't learn something.

With the proliferation of flight training devices on the market, I encourage every pilot to seek one out and experience the advantages of sim training.

Michael Leighton is a 10,000 hour, three-time master CFI/CFII/MEI/ATP and runs a flight school in Spartanburg S.C. and Vero Beach, Fla. You can reach him by email flymkleighton@gmail.com. Send questions or comments to editor@piperflyer.org.

RESOURCES >>>>>

Flight simulator training facilities – PFA supporters

Aerial Sim Training
aerialsimtraining.com

Fly MKLeighton Aviation School
flymkleighton.net

Legacy Flight Training
legacyflighttraining.com

Simulator manufacturers/distributors – PFA supporter

Precision Flight Controls
flypfc.com

Other simulator manufacturers (not a comprehensive list)

Redbird Flight Simulations, Inc.
simulators.redbirdflight.com

Frasca International, Inc.
frasca.com